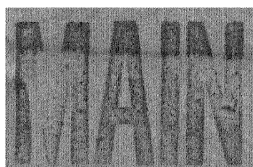




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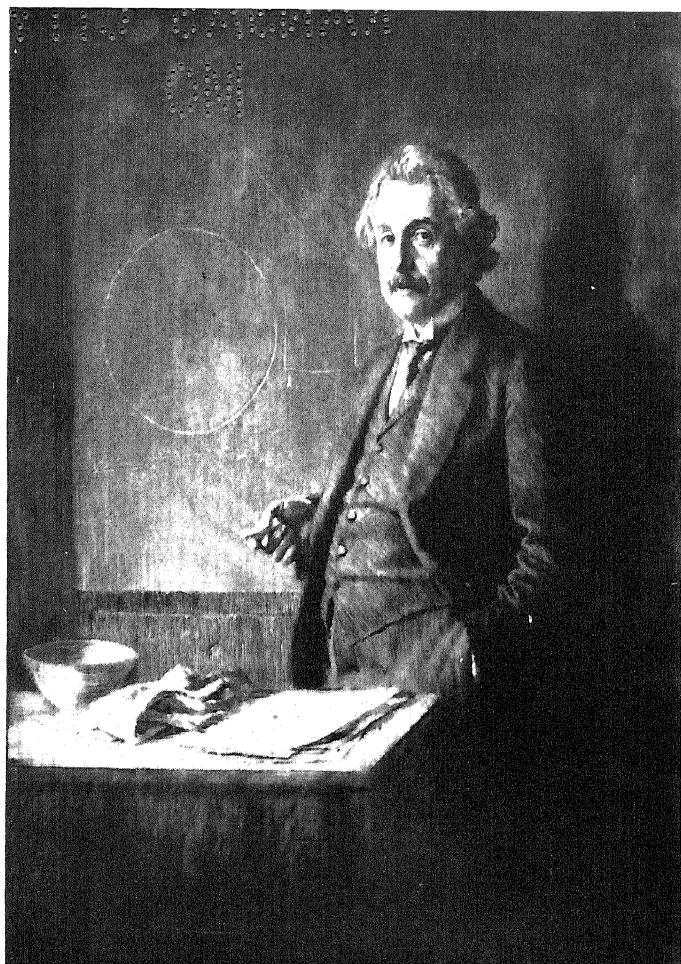
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*A. Einstein*

FROM AN ETCHING BY FERDINAND SCHMUTZER

# CONTEMPORARY IMMORTALS

BY

ARCHIBALD HENDERSON



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**TO**  
**ALBERT EINSTEIN**  
**THE MOST INTRICATELY ORGANIZED INTELLIGENCE**  
**OF OUR ERA—WITH UNMEASURED**  
**ADMIRATION AND REGARD**



## FOREWORD

ALL OF US believe that there is a quality of the divine in man—a spark, a seed, a creative force. Each of us at times has “intimations of immortality.” The deepest, most urgent impulse in humanity is not hunger, love, avarice, ambition. It is the desire to live—not merely in the flesh, but to transmit to posterity a vital expression of personality, rhythm, and temperamental nature.

With the vast majority this passion to live expresses itself in procreation, the transmission of the life-spark through being, sprung from our own loins.

With others this almost divine aspiration voices its need through the creation of great works of permanent vitality, beauty, utility. Thus come into being the fertile instrumentalities of advancing civilization and a higher culture.

These instrumentalities bear such names as music, art, literature, science, invention, philosophy, business, industry, discovery.

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These words are but symbols to represent, to express great products of human ingenuity, conspicuous exhibitions of human intuition and divination, elevating and edifying manifestations of æsthetic expression and spiritual aspiration. Men and women seek, through intense and concentrated expression of their powers, to make life glow with more vivid color, to uplift the hearts of humanity.

The qualities inherent in humanity and fostered by favorable surroundings which procure a greater enhancement of the sense of life, whether in the material accompaniments of existence or the release of the deeper spiritual longings, we are accustomed to label indiscriminately as talent, ability, greatness, genius. These qualities defy complete and adequate definition: they are the intangibles, the imponderables, in the fourth dimension of the spirit.

Genius is superlative excellence, in the field of either thought or action or both combined. It is capacity raised to excessively high power. The genius is not a freak: he or she is the supremely normal individual, with full use of natural powers. Those who are not geniuses are

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abnormal—imperfect in capacity, maimed in valued senses, deficient in important attributes which have remained undeveloped. “The greatest men on earth,” says Baldwin, “are men who think as I do, but deeper; and see the real as I do, but clearer; who work to the goal that I do, but faster; and serve humanity as I do, but better.”

Nietzsche regarded man as something to be surpassed. He was thinking of a higher form of life than man; but the genius always has in him something of the superman. Indeed, Nietzsche says that genius is “to aspire to a lofty aim and to will the means to that end.” Shaw similarly describes his Superman as one who “seeks in contemplation to discover the inner will of the world . . . and in action to do that will by the so discovered means.” Carlyle made only the beginning of a definition when he said that genius means “transcendent capacity of taking trouble, first of all.” All the geniuses I have encountered—Einstein, Shaw, Wilson, for example—have been the hardest workers and most indefatigable students I have ever known. The genius is very much like the average man—save

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for some incalculable modicum. It is this saving remnant of personality, this precious residuum of quality and temperament, which sets off the genius from the average man or even from the man of talent.

I venture to cite Pater's famous passage from *The Renaissance*, with a change of three words, as an approximate definition of genius:

"A counted number of pulses only is given to us of a variegated dramatic life. How may we see in them *all* that is to be seen in them by the finest senses? How shall we pass most swiftly from point to point, and be present always at the focus when the greatest number of vital forces unite in their finest energy? To burn always with this hard gem-like flame, to maintain this ecstasy"—that is genius.

And greatness? Inclusion in biographical dictionaries, oceans of publicity, honors, prizes, awards, position, popularity—none of these indubitably spells greatness. No: neither eminence nor fame connotes greatness—else were Dempsey greater than Marconi, Chaplin than Bergson, Mary Pickford than Marie Curie. Eminence is merely a relative term: the measure of the

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distance above the level of the mass. Karl Marx once said of John Stuart Mill that he owed his eminence to the flatness of the surrounding country.

The great man is one who lives for aims other than personal and local ones; who gives himself for posterity; who senses the future and strives for the race's betterment. The great man is one who procures for humanity a larger liberty, a freer release of vital energies, a wider horizon and vaster outlook, a greater and purer happiness, a completer mastery of the forces of nature and a deeper understanding of mankind.

It may well be that in choosing contemporary immortals we are only designating temporary immortals. We are not posterity; nor is our judgment, with any assurance of finality, the verdict of history. It requires hardihood to venture upon such a choice, since it is a form of prophecy—the vainest and most fruitless of all human activities.

And yet!—the human mind is endlessly avid of the forbidden and the “impossible,” and irrepressibly craves to do what has never been done before. In spite of all the arguments against

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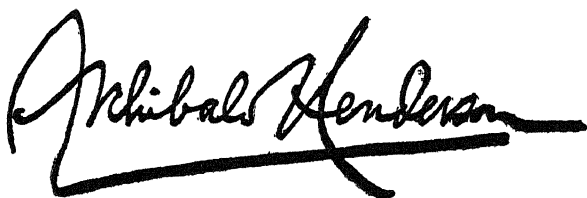
the likelihood of accurately identifying human genius and greatness, there is one unanswerable argument in favor of making the attempt. That argument, in one word, is: idealism. Great men and women are the fair images of our ideals. Geniuses are the towering effigies of our aspirations.

Nor can it be denied that, in making the attempt to distinguish the immortals among our contemporaries, the critic lays himself open to the charge of vanity. The critic must take his courage in his hands, well knowing that in the act of discrimination he is laying claim, by indirection, to partake of the nature of those whom he would select. It is the keenest of contemporary critics, Benedetto Croce, who says:

“In order to judge Dante we must raise ourselves to his level. . . . In that moment of judgment and contemplation our spirit is one with that of the poet, and in that moment we and he are one single thing. In this identity alone resides the possibility that our little souls can unite with the great souls and become great with them in the universality of the spirit.”

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It is in this humble mood of idealism that I have chosen as contemporary immortals: Einstein, Gandhi, Edison, Mussolini, Shaw, Marconi, Addams, Wright, Paderewski, Curie, Ford, Kipling.

A handwritten signature in black ink, reading "Archibald Henderson". The signature is written in a cursive style with a large, sweeping initial 'A' and a long, horizontal flourish at the end.



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### THE GENIUS IN PHYSICAL SCIENCE

EINSTEIN is one of those fortunate mortals who are witnesses of their own immortality. The recent extraordinary popular demonstrations on the occasion of his fiftieth birthday (March 14, 1929) attest the powerful hold his genius has laid upon the imagination of the world. The less comprehensible his theories, the more comprehensible are the admiration and wonder of the great public. *Omne ignotum pro magnifico*. Honors, degrees and gifts were showered upon him. Hundreds of letters and cablegrams poured in upon him from individuals and organizations in all parts of the world. Many gifts of money were sent for charitable causes and welfare funds which he has interested himself in supporting. A bust for the tower at Potsdam, a forest near Jerusalem to be planted and named in his honor, even the donation by the city council of Berlin of a tract of land six thousand feet square, situated at Cladow on Havel

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Lake, to enable him to indulge his favorite outdoor pastime, sailing.

Einstein has all the simplicity which rightfully belongs to genius. It is characteristic of his modesty that he fled Berlin in anticipation of the imminent popular celebration of his birthday, and sought quiet refuge on the banks of the Havel, his favorite retreat.

Significant of the psychology of genius was Einstein's mode of celebrating his own birthday. Shortly before attaining the golden age of fifty, he presented to the Berlin Academy of Sciences a brief communication, less than six pages of print, entitled "Toward a Unitary Field Theory." This monograph, embodying the results of ten years of painstaking research and profound reflection, is a far-ranging extension and application of his own theories, offering the means of combining the conceptions of electromagnetism and universal gravitation in a logical and inherent unity.

The theory is one of great technical complexity, requiring the employment of unfamiliar hieroglyphics. It may be years before it is possible to estimate the theoretical importance of

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the new theory, and even a much longer time may elapse before we are able to assay its practical consequences. Bolyai and Lobatchewsky were not primarily concerned with thoughts of utility when they developed the weird non-Euclidean geometry associated with their names. Little thought of practical considerations animated the minds of Riemann, Klein and Newcomb in their imaginative creation of the new kinds of space. Little did Christoffel, Ricci and Levi-Civita, as they played with new symbols and strange combinations, dream of the extraordinary rôle the theory of the absolute differential calculus was destined so soon to play in the new Einsteinian mechanics.

Incalculable effects upon practical life often follow directly and swiftly upon the theoretical contributions of science and invention. From the laws of electro-magnetism, which he had discovered, Clerk Maxwell inferred the possibility of producing electro-magnetic waves. A few years later, in a series of wonderful experiments, Hertz confirmed the existence of electro-magnetic waves. Twenty years later, it was by means of these very Hertzian waves that a pro-

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gressive New York newspaper, with a superb if fruitless journalistic gesture, was enabled to spread before its readers an exact facsimile of Einstein's brilliant monograph, hieroglyphics and all, the day after its issuance in Berlin.

The usual method of the physicist is to build up a constructive theory, from some comparatively simple basic propositions building up an organic structure of complex phenomena. This is a synthetic method of a thoroughly realistic and pragmatic character. Einstein's theories, on the contrary, as he himself has indicated, are theories of principle, analytic in character. "Their starting point and foundations are not hypothetical constituents but empirically observed general properties of phenomena no matter how complex, from which mathematical formulæ were deduced, formulæ of such a kind that they apply to all cases which present themselves." Recently asked if he did not hope for visual proof of relativity from the colossal 200-inch reflector now building, Einstein replied: "Not the eye but the spirit furnishes the proof of theories."

In the end, to be sure, experience is the final

and only competent judge. But Einstein's theories are particularly fascinating to the speculative mathematical mind, since they have not the familiar leaning towards positivism. "The characteristics which especially distinguish the general theory of relativity and even more the new third stage of the theory, from other physical theories," Einstein elucidates, "are the degree of formal speculation, the slender empirical basis, the boldness in theoretical construction and, finally, the fundamental reliance on the uniformity of the secrets of natural law and their accessibility to the speculative intellect."

In his latest theory, by the postulation of a particular type of space as that of our universe, Einstein has shown the mutual interrelation of electro-magnetism and gravitation. Such a union has long been suspected; and various scientists, notably Weyl and Eddington, have attempted unsuccessfully to effect it. Concerning Einstein's achievement in effecting this union, which has a mathematically artificial and purely formal basis, Weyl sounds a note of dubiety: "Science is an analysis of Nature, clear in itself, thoroly comprehensible, and based on critical

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reasoning and experience; it is not an incantation over senseless magical formulas." It is, of course, possible to invent an infinite number of theories which can be made to fit the facts; but the scientist inevitably seeks to formulate that theory which makes the fewest number of assumptions. Einstein's recent theory, for all its mathematical and formal basis, is of this essential character. The union of electro-magnetism and gravitation which he has theoretically effected, if experiment shall ultimately demonstrate its essential accuracy, promises, as has been aptly said, to produce "the greatest merger ever effected in human thought."

At Württemberg in Ulm, on the Danube, not far from the birthplace of Kepler, was born the physicist who has kept the astronomers of the world alert for the past decade. His father, Hermann Einstein, from the small town of Buchau on the Federsee; his mother, Pauline Koch, from Constatt on the Neckar, were Jewish people of a somewhat retiring nature. While Albert was an infant, his parents removed to Munich; and suggestive of early influence upon

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the child's plastic mind is the electro-technical factory operated by his father and his uncle. The field theory, which is Einstein's fundamental contribution to the study of gravitation, perhaps found its birth in the mind of the five-year-old boy when, as he lay in his cot, his father showed him a compass, the swinging needle of which fired his curiosity concerning cohesive forces and the mystery of the magnetic field.

Shrinking from the anti-Semitic hostility he experienced at the preparatory school and strongly reacting from the "drill-sergeant" methods of his teachers, young Einstein hoped to find a more favorable atmosphere at the Luitpold-Gymnasium at Munich, which he entered at the age of ten. The rough methods and self-opinionated tone of his teachers, who for the most part had the military attitude of non-commissioned officers, irked his spirit—although he remembers with gratitude a few of his instructors. His life during this period is memorable, not for high excellence in his studies at the Gymnasium, but for his indefatigable individual researches at home in intensive study, the solving of mathematical problems, the manu-

facture of little instruments to aid in the solutions of mechanical puzzles. He devoured L. Büchner's *Force and Matter*, which made a great impression on him, and A. Bernstein's *Popular Books on Physical Sciences*, at that day the best book of its kind and a very good book even now—which, as Einstein acknowledges, “has exerted a very great influence on my whole development.” These books were given him by Max Talmey, eleven years his senior, then a student of medicine at the University of Munich. Spieker's *Geometry*, Einstein's first mathematical textbook, also given him by Talmey, and Lübsen's work on analytical geometry and calculus enchaind his deepest interest. Einstein found it a delightful pastime to work out the problems and conduct the experiments; and it is remembered by associates of that period that he discussed physical phenomena and problems with the acumen and comprehension of an advanced university student.

After a year spent at Milan, to which place his parents had removed in 1894, the fifteen-year-old lad entered the admirable Canton School at Aarau, Switzerland. Under model instruction,

he easily prepared himself for entrance to the Zürich Polytechnicum. Even at this time he was reflecting deeply over the problem of the emission of light from bodies that move relatively to the ether—the germ of his subsequent revolutionary, special relativity theory. For four years he studied here, graduating from the *Lehramtschule*, the while carrying on his theoretical physical investigations quite independently, in studies of the writings of Kirchhoff, Helmholtz, Hertz, Boltzmann and Drude. After two years of private tutoring in Schaffhausen and Bern, he acquired a position as examiner of patents. Newton as Master of the Mint finds an analogy in Einstein at the Swiss Patent Office. This analysis of inventions, followed by laborious theoretical studies of his earlier years, constituted a powerful educative mental discipline; and Einstein himself acknowledges a “definite connection” between his technical and theoretical studies.

It was during his student days at the Polytechnicum in Zürich that Einstein formed an attachment for a fellow-student in similar studies, Milera Maricz of Serbia. Engaged while both

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were students at the Polytechnicum, they were married in 1903 after Einstein secured the stable situation at the Patent Office. At Bern, two sons were born, Albert in 1905 and Eduard in 1910. After some years this union was dissolved; and Einstein "found the ideal of domestic happiness" in his cousin, Else Einstein, to whom he was married in Berlin. This gracious and benignant woman, endowed with high intelligence, watches over her genius-husband with maternal solicitude; and shields him at once from the "gate crashing" world and from his own moods of depression and introspection.

During the lean years when he was struggling on a small salary at the Patent Office and living in a poorly furnished room, Einstein was maturing the fertile ideas over which he had long pondered. His first scientific paper to appear, in the *Annalen der Physik*, was entitled, "Consequences of the Capillarity Phenomena." Then with a rush like a great stream long pent up, a flood of contributions poured irresistibly forth, the result of long pondering over the nature of the physical world: "Concerning a Heuristic Standpoint regarding the Production and Trans-

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formation of Light," "Concerning the Inertia of Energy," "The Law of Brownian Movement," "A New Determination of Molecular Dimensions," his dissertation for the doctorate, and the epochal paper embodying the special relativity theory, "The Electro-Dynamics of Moving Bodies." The world of science remained unmoved, for new ideas are slow in gaining comprehension and support. One warm letter of appreciation, for the last-mentioned paper, came from the famous Max Planck, author of the quantum theory. It was manna in the desert of Einstein's loneliness.

In 1909 Einstein accepted *pro forma* the post of privy lecturer at the University of Bern, only to accept later in the same year the higher post of extraordinary professor at the University of Zürich, which received him with open arms. Two years later, he accepted the position, at a high salary, of ordinary professor at the University of Prague, where he remained for only one year, returning to Zürich as ordinary professor in the Polytechnicum. In April, 1914, following a call the preceding year, he accepted a distinguished post with the Berlin Academy of Sciences.

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Teaching at the University of Berlin was optional; but an important function of his new office was the management of the newly-founded Kaiser Wilhelm Institute for Physical Research. Here he has since remained, with occasional lectures as professor at the University of Leyden—lecturing on theoretical physics and from time to time publishing memorable papers in the *Annalen der Physik*. He has conferred upon the present age a distinction in science comparable to that enjoyed by the eras of Galileo and Newton.

In the year 1924-5, as Kenan Research Professor of Mathematics at the University of North Carolina, I was engaged in some researches, at Cambridge University and the University of Berlin, in certain phases of general relativity and the new theory of the atom associated with the names of Rutherford and Bohr. Early in January, 1925, I called upon Professor Einstein at his modest quarters, 5 Haberlandstrasse, in Berlin. The visit was by appointment, and I was received by Professor Einstein with easy informality. When I arrived, he was wearing a navy blue sweater; and he immediately put me

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at my ease by making no move to don his coat.

A noble head, black hair heavily sprinkled with gray worn *en brosse*, gleaming eyes, alternating between a merry twinkle and a detached, abstract contemplation; full and singularly red lips; a beautiful, marble-white forehead horizontally seamed with a perpetual wrinkle; and high, curiously twisted eyebrows which impart to the face a look of mingled *naïveté* and wonderment.

In street dress Einstein is a figure artistic and almost jaunty in appearance, accentuated by an overcoat reminiscent of some Parisian *habitué* of the Latin Quarter, and a black peaked sombrero, pressed in on four sides, the shape of the felt hat worn by the American soldier in the World War.

Graciously acknowledging some of my own writings on relativity, Einstein placed them on a shelf in a bookcase, filled with hundreds of books and monographs. With a smile and a deprecatory wave of the hand at the bookcase, he said, "All the writings in that bookcase are devoted to the theory of relativity." Another smile irradiated his face when I conveyed to him a message from Bernard Shaw, whom I had

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recently visited, in anticipation of writing the second volume of his biography. "Tell Einstein," Mr. Shaw remarked to me on my departure, "that if appearances go for anything, he is really a musician masquerading as a scientist. He looks infinitely more like Beethoven than like Leibniz." Einstein, with a wistful, soft glance, confessed to a deep love for music. As a boy he studied the violin for two years; and today he is an accomplished performer, playing classical music with finish, sympathy, and sensitiveness. In musical taste he is a classicist, feeling the deepest emotional response to the masterpieces of Bach, Haydn, and Mozart. Joachim and Brahms have exercised a traceable influence upon his life and feeling—much more than either Wagner or Beethoven. Einstein's head, square and massive, with forehead of medium height, and flying tendrils of curly hair, was an instant, vivid reminder of Beethoven, remembered from the classic portraits. Einstein spends many hours of his time at the pianoforte, finding in improvisation requisite relaxation from the inner conflicts and dissonances of tense reflection and scientific cerebration. Fortunately

Der Mensch sucht in einer ihm irgendeiner adäquaten Weise sein vereinfachtes und übersichtliches Bild der Welt zu gestalten und so die Welt des Daseins zu überwinden, indem er sie bis zu einem gewissen Grade durch dies Bild zu ersetzen sucht. Dies thut der Maler, der Dichter, der spekulative Philosoph und der Naturforscher, jeder in seiner Weise. In dieses Bild und seine Gestaltung verlegt er den Schwerpunkt seines Gefühlslebens, um so Ruhe und Festigkeit zu suchen, die es ihm allzu engen Kreise des wirbelnden persönlichen Daseins nicht finden kann.

Herrn Prof. Hunsen.

A. Einstein

Berlin 19. III 24.

MANUSCRIPT PAGE FROM EINSTEIN'S ADDRESS IN HONOR OF MAX PLANCK

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he can play with mathematics: it is a sport, a game. He delights in it as he does in music. Music and mathematics have always had a close and subtle alliance, since their scientific origin together in the discovery of Pythagoras. Leibniz, the great co-inventor with Newton of the differential calculus, not inaptly remarked, "Music is the pleasure the human soul experiences from counting without being aware that it is counting."

I also told Einstein another comment Shaw had made, indicative of his admiration for the great physicist. When I mentioned to Mr. Shaw that I was going to pay my respects to Professor Einstein, he pointed to the many portraits of celebrities hanging on the walls of his living room, and smilingly remarked: "The most convincing proof I can give you of my admiration for Einstein is that his is the only one of these portraits that I purchased for cold cash. All the others were gifts. That is the acid test of admiration for Einstein." To this story Einstein gave a hearty laugh, with the comment: "Very characteristic of Bernard Shaw."

I was deeply impressed by the objectivity of

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the great scientist in Einstein. When I congratulated him upon the verification of the third crucial test for general relativity, Einstein expressed his gratification over the successful results of Dr. Charles St. John's researches on cyanogen. St. John's report on the subject had just arrived, and he went over it with me carefully; but he protested that much study remained to be made of many other substances before verification of the test could be regarded as final and complete. This was all the more impressive, since the test was extraordinarily difficult and depended upon accurate measurement of excessively minute differences.

The basis for the test rested upon the unprovable but highly plausible assumption that an atom is a natural clock. So convinced was Einstein of the validity of his reasoning that he repeatedly declared his entire theory must stand or fall upon the verification or non-verification of this one test. Einstein boldly staked his entire theory upon the turn of this single card. A great gamble, you may say. No! Einstein was betting on a certainty; for in every other particular his theory had been confirmed with spec-

tacular exactitude. It could not be right in every other detail, and wrong in this. And yet!—even the boldest genius might hesitate to subject his supreme scientific contribution to such a delicate test of almost infinitesimal magnitude—to win or lose it all.

I am reminded of the words of the great French mathematician, the late Henri Poincaré, who thus spoke of Einstein long before he had won world renown: “What we marvel at in him, above all, is the ease with which he adjusts himself to new conceptions and draws all possible deductions from them. He does not cling tightly to classical principles, but sees all conceivable possibilities when he is confronted with a physical problem. In his mind this becomes transformed into an anticipation of the new phenomena that may some day be verified in actual experience.”

After attending many sessions of the graduate seminar held under Einstein's direction at the Kaiser Wilhelm Institute for Physical Research, I became convinced that Einstein was a triple-trait genius: of discovery, of invention, and of intuition. He displayed the genius of

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the discoverer in finding, first of all, that there is no way to distinguish a state of rest from a state of motion with respect to the ether, and in consequence that rest and motion are essentially relative conceptions. He displayed the genius of intuition in divining that the key to the mystery of universal gravitation is the fecund truth, hitherto regarded as casual and adventitious, of the equality of gravitational mass and inertial mass. Finally, he displayed the genius of the inventor in employing the conceptions of Gauss, Riemann and Minkowsky, the machinery of Christoffel, Ricci and Levi-Civita, in a re-interpretation of the cosmos through the medium of the new relativist mechanics.

A keen sense of humor, a pleasing open-mindedness, and a brooding detachment are conspicuous qualities of this singular genius. It is indicative of perfect detachment that the three portraits hanging upon the walls of his study, the trinity of his scientific faith, are not of three Germans, Helmholtz, Hertz, and Mach, but of three Englishmen: Newton, Maxwell, and Faraday. To his biographer, Moszkowski, Einstein once remarked: "In my opinion, the greatest

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creative geniuses are Galileo and Newton, whom I regard in a certain sense as forming a unity. And in this unity Newton is he who has achieved the most imposing feat in the realm of science. These two were the first to create a system of mechanics founded on a few laws and giving a general theory of motions the totality of which represents the events of our world." Perhaps to these two we shall now have to add the name of Einstein, to complete the immortal trio.

The researches of modern philosophers indicate that the highest geniuses often unite in themselves the qualities of both the artist and the scientist. "It is no longer possible," avers Havelock Ellis, "to deny that science is of the nature of art." In a long and interesting discussion I once had with Professor Einstein, he remarked to me that, after a certain high level of technical skill is attained, science and art tend to coalesce, in esthetic plasticity, and form. At first sight, relativity is a scientific structure, massive and complex. And yet it is characterized by a statuesque, plastic beauty, and by a cryptic, inner simplicity which we instinctively associate with classic art works. Relativity seems to me

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as great an esthetic creation as Shakespeare's *Hamlet*, Goethe's *Faust*, or Dante's *Inferno*. I divine in Einstein the most remarkable composite of art and science the world has known since that completest flowering in the figure of Leonardo da Vinci.

The last time I saw Professor Einstein was when I called at his home, to bid him adieu. I carried with me two large sheets of cardboard, the duplicate in case of possible accident to the original. I requested him to write on the sheet of cardboard a quotation from the memorial address he had delivered in 1918 in honor of Max Planck, the author of the quantum theory: "Professor Einstein, I wish to frame this sheet of cardboard and hang it on the walls of the scientific hall at my university. I regard this quotation as the most memorable and significant passage, from the human, artistic and scientific standpoints, I have encountered in the entire range of your writings." He wrote out the quotation, wrote in the corner "For Professor Henderson," and then genially said: "I see you have another sheet of cardboard there. Permit me to write the quotation on that one also—for

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you personally.” A more courteous or gracious act of spontaneous good-will I have not experienced.

The passage, fully, deeply revelative of the man and the scientist, the artist and the philosopher:

“First of all I believe with Schopenhauer that one of the most powerful motives leading toward art and science appears in the form of a desire to fly from the work-a-day life with its painful roughness and dreary wilderness, from the chains of ever-changing desires. It drives the more sensitive mind away from personal existence in a world of objective seeing and understanding. It might be compared with the longing that draws the citizen from his noisy, entangled surroundings toward the quiet mountains where his far-reaching gaze penetrates the clear air and follows restful forms which seem to be created for eternity.

“But to this negative notion is added a positive one: man tries to form a simplified and clear conception of the world in a manner somehow adequate to himself, and to conquer the world of reality by replacing it to a certain extent by

## ALBERT EINSTEIN

this picture. The painter, the poet, the speculative philosopher, and the naturalist do it, each of them in his own way. He places in this picture the center of gravity of his emotional life in order to find the tranquillity and constancy which he cannot find within the narrow limits of turbulent personal experience."

## MAHATMA GANDHI

### THE GENIUS OF INSPIRED LEADERSHIP

A REVOLUTION in the spiritual realm, which must eventually wield incalculable influence over the souls of men, has been begun in India. In essence, the meaning of this revolution is the replacement of materialistic and mechanistic civilization by *Gujurati*, the Indian word for good conduct. For some years past, India has been the immediate theatre of the activities of Mahatma Gandhi, the "Great Soul." This *avatar* of sainthood, this Hindu who, regarding Christ as the world's greatest teacher, may be regarded as his disciple, is teaching in India the doctrines preached centuries ago in Palestine, and in so doing is showing to the world the way to a greater spirituality.

Beside Gandhi's *Satyagraha*, the Sanskrit word for the "power of truth," the neo-Cæsarism of Mussolini seems only a childish rattling of toy swords. Beside Gandhi's *Ahimsa*, the love for all created things, the wrangles of the statesmen

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and political savants of the League of Nations are as sounding brass and tinkling cymbal. Over against the mass production and mechanization of labor in Occidental civilization stands the doctrine of reversion to the primitive in industry and the individualization of labor, which Gandhi has popularized under the name of *Swadeshi* (literally "home-made goods"). While the supreme goal towards which Gandhi pressed was *Swaraj*, home rule for India with its three hundred and twenty million people, the true meaning of Gandhi for the world is primarily not political, but spiritual. There are many people in the world today who regard Gandhi as the greatest of living beings.

So prone is the world to judge greatness in terms of material success, that Gandhi was long considered a failure because he was foiled in his first magnificent struggle to liberate his people. The "saintly turbulence," which so exasperated British leaders before Gandhi's arrest and incarceration in 1922, was followed by several years' retirement from political leadership and the abandonment of the policy of non-co-operation. Following a desperate illness, when he was

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released from prison in February, 1924, Gandhi lived the life of a spiritual leader and teacher and became the head of a school or university, bearing some analogies to the Santiniketan, the famous Indian University of Rabindranath Tagore. When, through Mr. Dhan Gopal Mukerji as kindly intermediary, I informed the Mahatma of his selection as one of the twelve contemporary "immortals" and strove to interest him in voicing some message to the world, he disclaimed all concern in the matter, in these words: "I have absolutely no heart in the work to which you have summoned me." At the Ashram, a co-operative settlement, on the Sabarmati River, near Ahmedabad, he devoted himself to religious meditation, taught the holy Hindu writings, daily received hundreds of visitors, many of whom regard him as a saint, and supervised the manufacture of the *Charka* or rude wooden spinning-wheel. There were always a hundred or more young people gathered from all parts of India, who were taught carding, spinning, the use of the hand loom and spinning-wheel, and afterwards sent back to their districts to instruct the masses in these primitive industrial

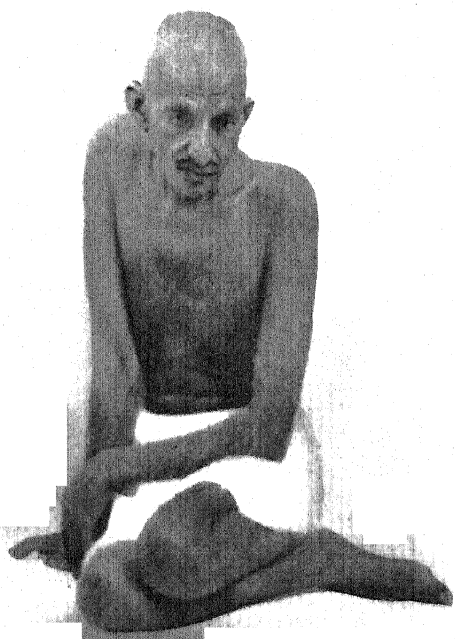
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arts. The leaven of Gandhi's spiritual teachings is worked silently and subtly throughout all India. Gandhi ceaselessly brought to bear upon the consciousness of India the two-thousand-year-old commandment of Buddha: "Man shall conquer anger by love, evil by good, avarice by generosity, and the liar by truth."

Gandhi is a great man because he has a noble and lofty ideal of living for his people. The great man is one who cherishes the dream of a purer, better world and lives wholly to that end. The great man is never to be judged by temporary failure or the inability to realize ideal ends—else were Lee judged by Appomattox, Wilson by the fatal Article X, and Christ by Calvary. The great man is without bitterness or rancor, envy or malice in his heart. He is guided by a spirit of understanding, sympathy and love. He knows the world and does not shun it. He knows humanity and does not forsake it. He is at once the practical idealist and the ideal realist. Such a man is Mahatma Gandhi.

At first blush, the whole program of Gandhi, its philosophy and technic, appears to Occidental eyes reactionary, impossibilist, and fantastic: to

substitute the spinning-wheel for the high-powered loom, to replace a complex civilization with a pastoral simplicity, to unite the jarring and disparate sects of India by engaging each man and woman in the weaving of a little *Khad-dar* (coarse, cheap white cloth); to muster peaceful processions and assemblages of protest; even to form an active and vigorous organization of non-participation in support of the government. Of what avail are these simple palliatives in the seething chaos of a sick and turbulent country? Gandhi's answer is that these are the only possible weapons available for securing the freedom of his people. He regards it as a disgrace and a national humiliation that three hundred and twenty million Indians should be dominated by one hundred thousand Englishmen. The nation which held his people in subjection, by means of force and tyrannical industrialism, he regarded as evil. The paraphernalia of modern industry, with its monopolistic features, he rejected as alien to the nature and the genius of India. Knowing that the industrialization of India would not come in his time, he laid hold upon the one instrument which would relieve the terrible poverty





and industrial subjection of India. In his polity, home rule and homespun were indissolubly connected. "What the Indian peasant needs," he proclaimed, "is not a revolution in agriculture, but a supplementary industry. India has almost seven hundred and fifty thousand villages scattered over its vast area. The great majority of the people face a hand-to-mouth existence. Because of the rainy monsoon seasons and the droughts between, millions are living in enforced idleness at least four months of the year. The most natural solution is the spinning-wheel, which was an essential in every home a century ago, but was driven out by deliberate economic pressure. Its restoration solves India's economic problem at one stroke. It saves millions of Indian homes from economic distress and is a most effective insurance against famine. Moreover, in weaning thousands of women away from factory life and the prostitution of the cities, the spinning-wheel is also a moral instrument."

Gandhi's advocacy of a return to the spinning-wheel is not a counsel of reactionary folly. Both as symbol and practice, it is a counsel of common sense. India's paramount problem is the main-

tenance of human life. One of Gandhi's greatest achievements was that of forcing the British government to face the terrible and tragic problem of poverty in India. Gandhi's resort to the spinning-wheel is an economic policy which, if universally adopted, would afford India a means of attaining a measure of economic independence of British manufacturers and monopolists. Why send India's chief money crop, raw cotton, thousands of miles to Lancashire mills, there to be turned into cotton cloth and sent back again the long journey to India—when every *ryot* could make *Khaddar* on his own farm, during the season of enforced agricultural idleness?

The political ideal of Gandhi goes far beyond the Tolstoyan doctrine of passive resistance. This ideal, as he acutely observes, is "like Euclid's line, which exists only in imagination, never capable of being physically drawn. It is nevertheless an important definition in geometry yielding great results." Gandhi is deeply impregnated with the doctrines of Tolstoy, of Thoreau and of Ruskin. Tolstoy long ago affirmed that passive resistance is "nothing else than the teaching of love uncorrupted by false

interpretations.” In a memorable correspondence with Gandhi in 1910, which left a permanent impression upon the Indian leader, Tolstoy said of this doctrine: “That love—i. e., the striving for the union of human souls and the activity derived from this striving—is the highest and only law of human life. . . . Christ . . . knew, as every sensible man must know, that the use of force is incompatible with love as the fundamental law of life, that as soon as violence is permitted, in whichever case it may be, the insufficiency of the law of love is acknowledged, and by this the very law is denied.”

For the first time in history, a political revolution was precipitated which had as its guiding motive and active principle the spirit of goodness and non-violence. Gandhi magnified the individual doctrine of passive resistance into the mass-action of non-violence. “Through love,” said Gandhi, “we seek to conquer the wrath of the English administrators and their supporters. We must love them and pray to God that they might have wisdom to see what appears to us to be their error. It is our duty to let ourselves be slain, but not ourselves to slay. If we are

cast into prison we must acquiesce in our lot without bad feeling, hate, or any sort of revenge." Tolstoy and Gandhi join hands: the spiritual revolution of Oriental civilization in its highest reaches is now full circle. Gandhi is gradually bringing home to the conscience of mankind—Hindu, Mohammedan, Brahmin, Christian—the deepest, purest thought of all the sages of history. It is the thought implanted deep in the heart of every human creature: that force and love are mutually incompatible.

The story of Gandhi's spiritual development and his emergence as a remarkable leader of his people is destined to give rise to an entire literature. Reared as the follower of the Jain school of Hinduism, Gandhi accepted in its widest significance as a basic principle of life, *Ahimsa*, the doctrine of non-injury to any form of life. After studying at a secondary school in India, he went to England at the age of nineteen, attended lectures at the University of London and at other institutions, and devoted himself assiduously to the study of law. After taking his legal examination on June 18, 1891, Gandhi returned at once to India. During his stay in

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England, he studied the Christian religion and the Bible, as well as the *Bhagavadgita* and other sacred Hindu writings; and kept the vow he had made to his mother to abstain from wine, meat and sexual intercourse.

Two years after his departure from England, Gandhi began his arduous crusade in behalf of the oppressed Indians, some one hundred and fifty thousand, who had emigrated to South Africa. Gandhi had attained unusual success as a lawyer, with an extremely lucrative practice. Abandoning his profession, he vowed himself to poverty, like St. Francis, and became the political and spiritual leader of the Indians. Sharing the afflictions of his followers and repeatedly suffering imprisonment for his activities, he developed those remarkable powers of Christlike self-control, fortitude and forbearance which have given him pre-eminence among men. The crusade against unjust and repressive laws was carried on by means of great public gatherings and monster processions of protest across the Transvaal. The guiding principle of the struggle, laid down by Gandhi, was non-resistance. After six years of the most indefatigable

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efforts, during which time thousands of Asiatics were flung into prison and treated with the utmost severity, the victory was won. Gandhi was ultimately supported in all of his main contentions in behalf of the oppressed Asiatics. General Smuts who early had declared that he would never erase from the statute books the measures so prejudicial to the Indians, confessed in the end that he was glad to do away with them.

Gandhi's victory in South Africa immortalized him in the eyes of his countrymen. It was as a conquering hero that he returned to India. Throughout the World War Gandhi remained loyal to the British government, organized an Indian ambulance corps in London, and four times risked his life. The roseate promises of constitutional government and the strong intimations that home rule would follow, were dangled before the eyes of the people by Lord Chelmsford, E. S. Montague and Lloyd George. These promises aroused the enthusiastic support of India which first and last contributed upwards of a million soldiers and an untold amount of effort to the cause of the Allies. The passage of the Rowlatt Bills, rushed through the Imperial

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Legislature at Delhi in 1919, was regarded as a betrayal of India and a repudiation of her pledges by Great Britain. These bills in effect prolonged indefinitely in peace times many irksome and restrictive war measures. Their passage was the signal for revolt.

The Mahatma inaugurated the movement by setting aside April 6, 1919, as a day of fasting and prayer, imposing a *hartal* (stoppage of business) on all India. For more than a century, passive resistance, a veiled form of boycott, had been invoked as an instrument of protest in India—at Benares in 1812, in Mysore in 1830, in Bengal under Aurobindo Ghose at the beginning of this century. In 1905, Bal Ganghadhak Tilak, the most powerful influence in India, who was honored with the title *Lokamaya*, leader of the people, lifted the banner of *Swaraj*—self-government. Thus it is plain that events and personalities had long been preparing the way for Gandhi. He is the spiritual descendant, the worthy heir, of his predecessors.

The movement inaugurated by Gandhi in 1919 was given by him the name *Satyagraha*. It went far beyond the passive resistance of Tolstoy.

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The movement was one of active resistance—a resistance finding its outlet, not in violence, but in the active instruments of love, faith, and sacrifice. For three years the world looked on at this movement with curiosity, admiration, astonishment and dismay. Throughout 1919 and 1920 Gandhi led great assemblages of the people and won complete control of the movement. The Punjab tragedy at Amritsar, when hundreds of defenceless Indians were shot down by British machine guns because they had assembled in violation of public proclamation, sent a wave of indignation throughout India. The Khilafat difficulties, arising from the curtailment of the temporal power of the Sultan, who is regarded by Mohammedans somewhat as the Pope is regarded by Roman Catholics, resulted in uniting Mohammedans and Hindus against the British *Raj* (rule). Gandhi now precipitated the movement of non-co-operation, which was to begin on August 1, 1920, prohibited all violence, and commanded complete order in the execution of the movement. The purpose of the program, which had eight cardinal points, was withdrawal from the support of the British government, and the

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inauguration of a movement of a general nature leading to economic independence and home rule.

Now ensued that extraordinary series of demonstrations all over India, participated in by many millions of people. An almost supreme power seemed to lie in the hands of the singular and unimpressive figure of Gandhi—the mere skeleton of a man, naked save for a *dhoti* about his loins; a sufficiently unprepossessing physiognomy marked by a bald head, protruding ears and thick lips. But despite this unlovely countenance, his brilliant eyes revealed the majesty of his mind and the beauty of an indomitable soul. Gandhi had invoked spirits which he could not control. India in revolt was a Frankenstein monster, which refused to abide by the spiritual doctrines of its creator. Following the visit of the Prince of Wales to Calcutta, when on December 24, 1921, he passed through a deserted city, Gandhi was invested with supreme powers by the Indian National Congress, which proclaimed its opinion that civil disobedience is a weapon equally effective and more humane than armed rebellion. The disorders which followed led to the arrest of some twenty-five thousand

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persons who gladly went to prison. Following the massacres and burnings at Chauri Chaura, Gandhi issued an extraordinary proclamation, acknowledging this incident as the third warning he had received from God that the people of India had not yet attained the complete spirituality requisite for carrying out the policy of non-violence and mass-disobedience. In penance, he imposed upon himself a five-day fast. On March 10, 1922, Gandhi was arrested; and the "Great Trial" began eight days later. It is one of the most remarkable political trials in history, because of the great deference shown each other by the prisoner and the judge. In his great speech, he said: "I do not ask for mercy. I do not plead any extenuating act. I am here, therefore, to invite and cheerfully submit to the highest penalty that can be inflicted upon me for what in law is a deliberate crime and what appears to me to be the highest duty of a citizen." In his chivalrous reply, Judge Broomsfield said: "It would be impossible to ignore the fact that in the eyes of millions of your countrymen you are a great patriot and a great leader. Even those who differ from you in politics look upon

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you as a man of high ideals and of noble and even saintly life.”

For some years Gandhi was looked upon as a lost leader, the shadow of a great name; but recent events lead to the belief that the seed he has sown so perilously and fostered so patiently may come at last to life and fruition. Gandhi recognized, in seeking the freedom of his people, “the inevitability of gradualness,” which Sidney Webb has recognized in regard to Socialism. He had lost faith in British promises, Simon Commissions and round-table conferences. The Nehru Constitution demanded either entire independence, or a dominion status for India.

In this fateful year of India’s history, the new program of non-violent opposition to British rule has been inaugurated, in simple and solemn protest against Great Britain’s refusal to accede to India’s demand for complete independence. There have been monster demonstrations of protest, the march of thousands of native troops, the manufacture of salt in violation of British law. Gandhi demanded of British leaders that they “accompany their promises with convincing

gestures." Despairing of procuring for India even complete dominion status, while longing for absolute independence, Gandhi in March last inaugurated a dramatic campaign of civil disobedience. Non-violent resistance, refusal to pay taxes, boycott of British goods, establishment of native courts, monster demonstrations of protest: these are the forces which Gandhi has invoked. The salt tax in the Indian revolution is likened to the British tax on tea in the American revolution. It stands as a symbol for the oppression against which India revolts.

At the moment of writing, the newspapers of the world bristle with the stirring news from India. Already there have been many outbreaks, uprisings, demonstrations, in various parts of India, accompanied by acts of violence, murders, atrocities. Gandhi himself, together with other leaders and devoted followers, have been arrested and incarcerated. It is the fate which Gandhi courts: martyrdom for the sake of the nationalist cause.

It was through Gandhi's influence in the Indian National Congress that the radical wing, which demanded complete severance from the

British Empire, was defeated on December 29, 1930. But when Gandhi failed to secure from the Viceroy a definite promise as to the nature and date of the conferring of dominion status, he surprised the world, including his own followers, by ordering the campaign of civil disobedience in March. Ramsay MacDonald is known to favor the granting of dominion status to India by means of commission and conference, a method deeply distrusted by Gandhi and his followers. The outcome of the present revolution is problematical. Gandhi does not desire a violent separation from Great Britain, proclaiming that he would prefer eternal bondage to the shedding of a single drop of blood. Already a rich libation has been poured upon the altar of liberty. The world is not ready for bloodless revolutions of non-violence. Whatever the immediate outbreak of the present revolt, which has scarcely assumed the full proportions of a revolution, there is strong likelihood that Gandhi's efforts will speed the coming of a larger measure of self-government for India.

There is a note of the sublime in the challenge of this new David, the frail ethereal Gandhi, to

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a new Goliath—the mightiest empire upon the earth:

“We have given the British their last and greatest opportunity. If they accept it—well, that is destiny. If not—that is perhaps better destiny for us. I, for one, will breathe freer. . . . The suffering will do us good—we have deserved it—and I welcome it. In the end India will be really free, politically and culturally, economically and spiritually.”

The influence of Gandhi in India is beyond the power of computation. Like the Tolstoy of *The Kreutzer Sonata*, he preaches for the present, when starvation is a constant menace in India, *Brahmacharya*, abstinence from all sexual intercourse. He has set his face against child marriage, a chief source of India's supineness and futility; he is laboring to lighten the lot of the pariahs, who constitute one-fifth of the population, and to destroy the horrible fetish of untouchableness. He has striven to alleviate the lot of the prostitutes, and to stir the minds of men in India and throughout the world, to shame for dedicating women to men's lust. Gandhi has accomplished the impossible by uniting, if

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only for a time, the people of India—a people with eleven different languages and uncountable religions, sects and creeds.

The greatest contribution which Gandhi has made toward the renascence of India is his own life, which bears a remarkable analogy to the life of Christ. It lacks, says Rolland, only the cross. The greatest victories of life are not won upon the battlefield; the spoils are not always to the victor; nor to the conqueror always the palm and crown. Gandhi has wrested his victory from defeat; and the end of souls that have not known defeat is victory.

## THOMAS ALVA EDISON

### THE GENIUS IN INVENTION

ONE day in the autumn of 1877 an American inventor was seated in his laboratory. Grouped about him were half-a-dozen aids and associates. On a table rested a little model made by the expert technician, John Kreusi, for the sum of eighteen dollars, the price limit set by the inventor. The gathering viewed the toy with some skepticism, and Edison's own face wore a look of half quizzical expectancy. "What is the little toy?" asked one of the number. "This is a machine to record talking and then to repeat it," Edison answered.

The skepticism now became vocal. The idea was plainly a practical joke. Carman, the foreman of the machine shop, bet Edison a box of cigars that the machine wouldn't work. Nobody believed it would work. Edison was sure of the principle, but dubious about the machine's "delivery."

The little machine looked innocent enough:

## THOMAS ALVA EDISON

a cylinder provided with grooves around the surface covered with tinfoil, which readily received and recorded the movements of the diaphragm.

"Mary had a little lamb!" shouted Edison. Then he adjusted the reproducer and set the machine in motion. To the attentive ears of the dumbfounded listeners came from the little machine Edison's words, perfectly reproduced: "Mary had a little lamb."

Rolling his eyes heavenward, Kreusi ejaculated in awe-struck tones: "*Mein Gott in Himmel!*"

"Boss, you win," grunted Carman, disgusted over the loss of a box of cigars.

"I was never so taken aback in my life," Edison himself afterwards admitted, in describing his sensations on hearing the little machine speak to him.

As soon as "the boys," as Edison's associates were known in the plant, recovered from their astonishment, they joined hands and danced around Edison in a circle, shouting and singing. The phonograph—one of Edison's most brilliant, original and magic inventions—was born.

Half a century later the first and original

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model of his phonograph, which Edison had lent to the British government for exhibition in its Patent Office Museum at South Kensington, London, was returned to him on the occasion of a national celebration in his honor at West Orange, New Jersey.

This phenomenal feat of the invention of the phonograph sums up for me the scientific significance of the age. This invention, which was likewise a discovery, represents in its purest form the genius of Edison and at the same time symbolizes the genius of America; for invention and discovery are joined in this spectacular creation of our era. Many great scientists and inventors—Galileo, Roger Bacon, Gutenberg, Copernicus—have suffered persecution for their discoveries or died in want. Edison is one of the few great inventors of history to become a great captain of industry and after half a century to see his invention revolutionize the world.

In the phonograph, science and art joined hands to contribute to the edification and happiness of mankind. How often the minds of men have been filled with longing to hear from their own lips the words of the prophets and the seers

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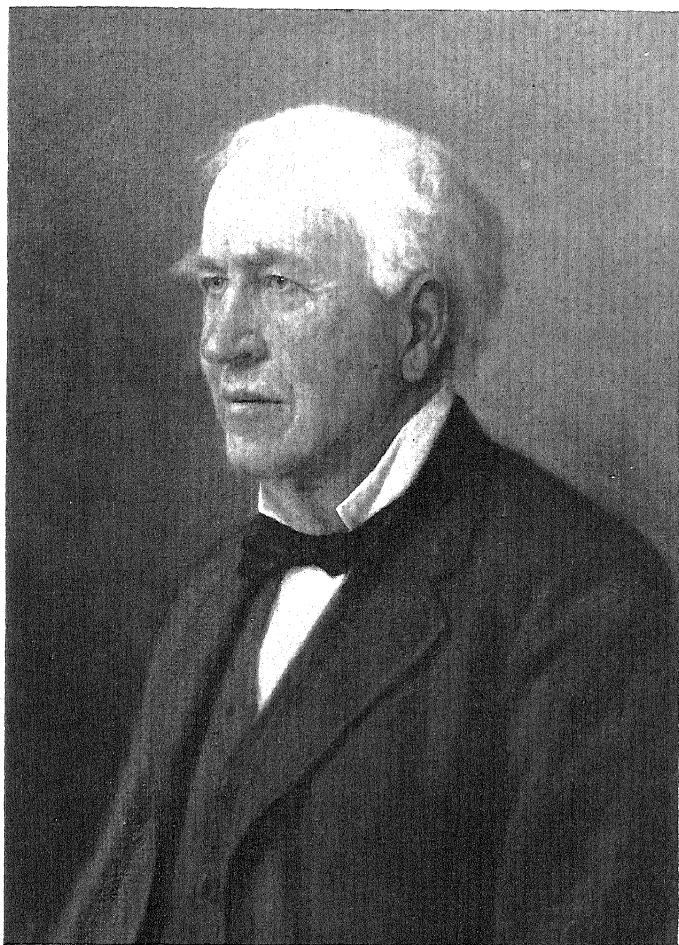
of all the ages; to know them condemned or justified out of their own mouths; to listen according to their nature or their mood to the conversation of Socrates with his pupils; to the commands of Napoleon at Austerlitz; to the farewell words of Lee to his ragged veterans at Appomattox; to the words of Christ himself as he spoke upon the mountain!

Posterity will owe to Edison an incalculable debt. For them the dead will rise again and bear witness to the truth. For them the history of the past will reconstruct itself in the words of the great and the near-great of our own times. The vast panorama of our age will spread before them in a glittering canopy of sound. Each age shall write its own symphony. Our own will be the "Symphony of the New World," and the theme of Edison will rise triumphantly clear and vibrant amidst the tumult of sound.

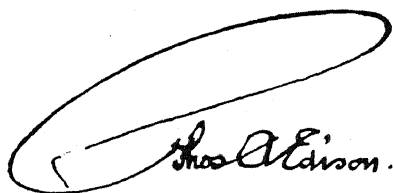
The phonograph was a *tour de force*: original with and unique to Edison. He discovered, first, that the vibration of a lever gave rise to an audible note; and he reasoned that if a paper strip were indented with elevations and depressions representative of sound waves, these might be

caused to actuate a diaphragm so as to reproduce the corresponding sounds.

The essential quality of Edison's genius is patience. He is probably the most painstaking and persistent experimenter in the entire history of invention. Preserved in his laboratory at Menlo Park are more than a thousand note-books, of two hundred pages each, containing his ideas, sketches and memoranda for future investigations, as well as descriptions of countless thousands of experiments already carried out. Upon the storage battery alone, to take a single example, more than fifty thousand experiments were carried out by him or under his direction. For a whole year, the better part of every day, Sundays included, he labored to secure the accurate reproduction of the word "specie" by the phonograph. Within the past few years Edison has examined fifteen thousand plants, trees, and shrubs within the United States to discover their possibilities as rubber producers. Of these he has discovered over twelve hundred wild plants, each different from the other, which contain appreciable amounts of rubber. Concerning these researches he quizzically remarked: "In my opinion



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the patience of Job has been considerably over-rated. He did not know what patience is." Edison's technic is the terribly wasteful but ultimately fecundative method of Nature. For tens of thousands of eggs laid by a codfish, only a few—perhaps only one—mature!

This feature of Edison's work—the well-authenticated record of years of experimentation upon a single invention, however small or apparently simple in its construction—has given rise to the popular view that Edison owes many of his successes to blind luck, and that not a few of his inventions are happy accidents in a multitude of haphazard experiments. When one of Edison's young assistants plaintively exclaimed that several thousand experiments had brought no results, Edison hardly exclaimed: "No results! Why, man, I've gotten a lot of results! I know several thousand things that won't work." The library in his private laboratory contains some ten thousand volumes. Constitutionally skeptical, he has the habit of testing the experiments of others—a terribly wasteful, but highly safe procedure; and only then uses the results as the starting point for his own researches. He

never begins a new line of experimentation until he has mastered the range of literature concerned with that subject.

Asked on his seventy-second birthday for his philosophy of life, Edison replied: "Work—bringing out the secrets of nature and applying them for the happiness of mankind." The practical bent of Edison's mind toward industrialization is a quality peculiarly American. Inventors of purely theoretical interest hold a lower place in his estimation. Edison disclaims the title of pure scientist, preferring to be rated as a practical worker in applied science, with a strictly utilitarian bent. He has tirelessly devoted his fertile ingenuity, his inventive skill, his comprehensive knowledge, his vast experience and his creative genius first to invent and afterwards to perfect the invention, so as to be not merely useful but also commercially available. This is termed the machine age; and quantity production is a peculiarly American ideal. But Edison's injunction, sternly inculcated in his assistants, has always been a counsel of perfection. Quality has been his ideal; and not until the highest quality has been achieved is quantity given

consideration. "A machine age," he maintains, "cannot be a stupid age. It has to be a highly intelligent age. A workman who is only a human machine without intelligence cannot operate or supervise a highly developed piece of machinery. . . . One of the effects of machinery has been to increase general intelligence. . . . The motion picture is the greatest quickener of brain action we have ever had. . . . Today a title of from twelve to fifteen words is shown in about twelve seconds and is understood by 95 per cent of the audience without effort. Thirty years ago only 10 per cent of the audience would have understood it."

Discovery, which is almost universally regarded as a supreme mental feat, is ranked by Edison as secondary to invention. Edison's term for discovery is a "scratch"—mere contact with the surface of a deep empirical problem. Countless discoveries are made by men of high imaginative powers who do not possess the inexhaustible patience, the fertile ingenuity and the will of tireless experimentation required to bring the discovery to the stage of practical application and commercial use. In Edison's view,

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the true inventor is, in essence, a benefactor of mankind; and invention is the work of the experimental genius who is able to bring discovery to the phase of industrial utility.

Edison is an extraordinarily successful practical inventor with singular lacunæ in his education, strange interspaces of ignorance in the stream of his comprehensive knowledge. One of the most extraordinary proofs of his genius as inventor in the fields of physics, mechanics, electricity, chemistry and engineering is found in his triumphs achieved without a knowledge of the higher mathematics. Like Faraday, whose works he sedulously studied, Edison is a master experimenter, who succeeded without any comprehensive knowledge of mathematics.

Beside the intricate texture of a brain like that of Willard Gibbs, Albert Michelson, Albert Einstein and Nils Bohr, the processes of Edison's brain, as mathematician and physicist, seem elementary and simple. When taken to task for his ignorance of mathematics, Edison replied with lofty disdain: "I can hire all the expert mathematicians I want, but they can't hire me."

On one occasion he asked several mathemati-

cians to compute the volume of an incandescent light bulb. The surface of revolution, which enclosed the required volume, is derived from a curve which has to be found by empirical methods. A slight variation in this curve gives a much larger variation in the required volume. The result, a consequence familiar to the mathematical mind, was that the expert mathematicians supplied Edison with answers for the volume slightly differing from each other in volume.

Edison retorted that he could beat the mathematicians at their own game. He had a series of metal cubes constructed, like a nest of Chinese boxes, each slightly larger than the other. He filled the glass bulb with water, and by pouring the water from the bulb into each of the metal cubes in turn, he quickly arrived at that cube which exactly contained the contents of the bulb. The calculation of the volume of the cube was only a matter of a few seconds.

This is a revealing incident, exhibiting Edison's handicap in his ignorance of mathematics, the ingenuity with which he overcame this handicap, and the disproportionate amount of trouble, labor and energy he was willing to expend to

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arrive at a simple result. The mean of the mathematicians' results would have given him a closer approximation to the volume of the bulb than any empiric measurement by a cube mechanically constructed. Edison's methods were often laborious, exceedingly expensive, highly wasteful, and dreadfully time-consuming. But with amazing inventive ingenuity, backed by financial means, he succeeded in overcoming triumphantly the handicaps of ignorance and imperfect education.

Edison has gone through life with the burden of severe handicaps. Fortunately other forces, some inherent, some acquired, have been at work to help neutralize and offset these handicaps. As a small boy Edison showed exceptional business capacity and initiative. In connection with his profession as "news butch" or seller of newspapers, candy and the like, he established a printing press and a small laboratory upon the train. At the age of fourteen he was train boy, newspaper owner and editor, and amateur research chemist—carrying on all three professions alternately, if not simultaneously, from a tiny compartment of the baggage car! *The Weekly*

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*Herald* is believed to be the first paper ever printed on a moving train in history. Unfortunately young Edison could not insure against chemical mishaps; and one day when an explosion took place, setting the car on fire, the irate conductor flung the press and chemicals out on the ground and gave the boy a terrific cuff on the ear. Edison's deafness, one of the most distressing of the handicaps under which he has suffered, dates from that incident. By developing a sort of "inner ear," highly sensitive to strong mechanical vibrations close at hand, he has triumphed over this handicap. This sensitive inner ear enabled him to study the phonograph, as a transmitter of sound and enunciator of speech, with the most delicate accuracy. He improved the weak transmitter of the telephone by experimenting with it until he could hear it. In the same way he perfected the phonograph, eliminating overtones and consonantal sibilance. Edison maintains that in various ways his deafness has actually been of great advantage to him. It taught him aural concentration of high power at close range—sounds not close at hand being entirely unheard. And think how much he has

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been spared! "The noise of a city," he once cheerfully remarked, "doesn't trouble me at all. On Broadway I can be as undisturbed as the average man can be in the deepest recesses of the most silent forest."

A second severe handicap from which Edison has suffered is the lack of formal education at high school, college or university. As a small boy, the excessive size of his head aroused suspicion that he had "brain trouble." His singular mentality and unquenchable curiosity provoked his teacher to the assertion that his brain must be addled. In a white heat of anger and protective pride, his mother took him out of school at the end of three months. She was a school teacher by profession, and being a most sympathetic and understanding woman, she gave him devoted instruction at home. Before he was twelve years old, in addition to learning the usual rudiments, he had read, with her help, Gibbon's *Decline and Fall of the Roman Empire*, Hume's *History of England*, Sears' *History of the World*, Burton's *Anatomy of Melancholy*, and the *Dictionary of Sciences*. He and his mother even had the hardihood to tackle Newton's *Prin-*

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*cipia*, but the mathematics proved too much for them. Even today Edison still maintains that capacity for leadership is innate, and that if a boy is ambitious he doesn't need to go to college. "Formal education," he recently declared, "seems to paralyze curiosity. . . . There is no question in my mind that our education has not kept pace with the quicker intelligence that almost everyone has today as compared with only twenty-five or thirty years ago."

Edison's lack of formal education of the conventional type, especially the high mental discipline of the best university training, has exhibited itself in the lavishly wasteful methods of his experimentation, the tremendous amount of time he has lost in life through having to acquire laboriously knowledge that should have been his under normal circumstances, his scorn for the cultural side of education, his numerous and conspicuous "blind spots" on life, knowledge and culture as a whole, and respect for only the practical type of education which enables people to work efficiently, to do things.

Edison's ideal for education is engineering, used in the broadest sense. From this restricted

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point of view only may be justified the petulant exclamation of this self-educated engineer and inventor:

"I wouldn't give a penny for the ordinary college graduate, except those from the institutes of technology. They aren't filled up with Latin, philosophy and the rest of that ninny stuff."

Unlimited fun has been poked at the first Edison "questionnaire," a searching test for those trained especially in chemistry, metallurgy, geology and engineering. In this test, as well as in the above-quoted opinion, Edison was judging mentality exclusively with reference to its value to him in his factories, for doing the sort of work he needed to have done. He is exceedingly impatient with ignorance, mental slothfulness, and physical laziness. Despite all the inventive marvels of the present day, for many of which he is responsible, Edison declares that "we are only beginning to get the benefits of machinery. In some directions we have progressed a fair amount. In other directions we have scarcely done anything. But the most that we have done in any line is insignificant as compared with what can be done." Unforgettable

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are the vehement words of this great self-educated engineer and inventor:

“We don’t know one millionth of one per cent about anything! Why, we don’t even know what water is. We don’t know what light is. We don’t know what gravitation is. We don’t know what enables us to keep on our feet, to stand up. We don’t know what electricity is. We don’t know what heat is. We don’t know anything about magnetism. We have a lot of hypotheses, but that is all. We are just emerging from the chimpanzee state mentally.”

Set Edison beside Leonardo da Vinci as *Kultur Mensch* and he comes out nowhere; but compare them as inventors and Edison surpasses Leonardo in many fundamental respects. Edison is a “transition man,” in Nietzschean phrase. He bridges over the gap between the present and the future. If the empirical habit, the inventive turn and the commercial instinct find in him an extraordinary fusion, these are accompanied by an insatiable desire for knowledge. In the arts and philosophy, Edison is as much a tyro as was that other American genius, lovably primitive, the late Mark Twain. But in experimental

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science and practical invention, Edison is a superman—living, as he says, in a great moving world of his own.

Bulky volumes would be required to catalogue and describe the great number of Edison's inventions. In the United States Patent Office Edison has filed considerably more than fourteen hundred applications for patents, as well as caveats embracing some fifteen hundred additional inventions. Edison's inventions have played a paramount and fundamental rôle in motion-pictures, telephones, electric railways, electric lighting and power, electrical supplies and fixtures, phonographs, electric-car shops, dynamos and motors, storage batteries, cement, telegraph and wireless telegraph.

The year 1929 witnessed great national celebrations in this country in commemoration of Edison's invention of the electric light bulb just half a century ago. Edison was presented a gold medal, struck off at the order of the United States Congress, in honor of this great achievement; and a special commemorative stamp, bearing the design of an electric light bulb, was issued. The invention of Edison's which exerted

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the most far-reaching effect and has proved of greatest value to the world is universally conceded to be the invention of the incandescent lamp and the intricate system for the distribution of electric light, heat and power. In the matter of house lighting, Edison began his experiments in the Age of Kerosene. The arc light was already in operation to a limited extent; but the vast, unsolved problem, the dream of scientists and inventors, was the subdivision of the electric current.

The enormous cost of copper, then used for conductors, rendered preclusive through this medium the effectuation of a commercial system of universal lighting for cities. Far from following the lead of his predecessors, Edison boldly faced about and, as he has frequently done throughout his career, directed his steps in the opposite direction. The essential requisite was a low-price conductor, a lamp of high resistance for a small quantity of current, and a burner with small radiating surface.

The story of his quest for the gleam is more thrilling than any romance of the Middle Ages.

This great adventure of the spirit illustrates

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the qualities of Edison's genius at their full potency. He approached his task with giant energy, headlong and enthusiastic fervor, and a reckless disregard of financial cost that stirs the blood. Using carbon as a base, he experimented with hundreds of substances, in the effort to discover a tough, hair-fine filament for a light-giving body that could be maintained at white heat for a thousand hours before breaking; and he must make his invention so cheap as to place it within the reach of every man. A Herculean task!

The first crucial discovery was that the filament must be enclosed in a bulb exhausted of air. By experimenting assiduously in the field of high vacua, Edison finally succeeded in producing a vacuum up to one-millionth part of an atmosphere. The next search was for the perfect filament. The sum of one hundred thousand dollars, first and last, was expended in scouring the world for vegetable growths, of which six thousand were tested; but none proved so satisfactory as the strip of cane binding a palm leaf fan, which Edison hit upon as almost ideal material. For a number of years, millions of Edi-

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son lamps were regularly made from a particular species of Japanese bamboo. Other artificial filaments have since displaced bamboo.

The date, October 21, 1879, is historic. For then, by means of a carbonized piece of cotton sewing thread in the form of a loop, enclosed within a glass globe from which the air was exhausted, the practical incandescent lamp came into being! After countless experiments, a lamp had been invented which, when put on the circuit, maintained its integrity for forty hours. So intense were the fervor and excitement of Edison and his helpers—the famous “insomnia squad”—over this crucial experiment that they watched the lamp without intermission during the forty hours of its epochal illumination.

Edison has had his heart-breaking failures, as well as his dazzling successes. He early invented a system of sending telegraph messages from a moving train to the central office. Through absorption at the time in another group of ideas, Edison overlooked certain former experiments; and so missed the chance of anticipating by many years Marconi's invention, as a commercial instrumentality, of long distance wireless telegraph.

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raphy. Edison expended nine years of his life and a fortune of two million dollars in inventing and setting up machinery for extracting metal from ore—only to lose everything through the accidental discovery of rich Bessemer ore in Minnesota which could be sold at little more than half the cost per ton of Edison's briquettes. On December 9, 1914, Edison's huge manufacturing plant at West Orange, New Jersey, was visited by a devastating fire. As Edison calmly viewed the work of destruction, he said with stoical courage: "I'm sixty-seven years old, but I'm none too old to take a fresh start tomorrow morning. Nobody is ever too old to take a fresh start."

One of Edison's greatest triumphs was the invention in 1899, after much experimentation, of the first modern motion-picture camera. From that day until now, the Edison camera has been the accepted standard for securing pictures of objects in motion. The principal American manufacturers of motion-pictures for many years paid a royalty to Edison under his basic patents. Edison was an important figure in the invention of talking motion-pictures, which

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still urgently need his patient genius—since they fall so lamentably short of perfection!

Edison is a double personality: stern, relentless in the laboratory; gracious, genial and humorous in his home and in society. A strong man of sturdy physique, who manages always to keep fit; blue-gray eyes lit with humor, which have a direct and challenging fixity, splendid head, with wrinkled face and sharply accentuated features—Edison is almost universally regarded as the greatest living American. Eminent scientists have said that for more than a generation Edison has himself been an educational institution of the first rank. So completely has he dominated the electrical industry that some people, as Mr. Andrew Mellon deftly puts it, believe that electricity itself is merely another one of Edison's inventions. It has been estimated that upwards of twenty billions of dollars are invested in industries founded upon his inventions. Henry Ford, who is fond of remarking that America owes its world supremacy in progress to Edison, recently declared that Edison has done more for mankind than any other man. Edison, if he himself is to be be-

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lieved, is described in his own amusing definition: "Genius is one per cent. inspiration and ninety-nine per cent. perspiration." When proclaimed a genius, Edison laughed it off with the brusque comment: "Stuff! I tell you genius is hard work, stick-to-it-iveness and common sense."

Such genius as Edison's cannot be explained. It can only be wondered at. For he is an absolutely normal man in all his reactions; healthy, vigorous, good-humored, impatient with stupidity, naïve, high-tempered but self-controlled. His most salient qualities are: a passionate pre-occupation with work, amounting to an almost frenzied application; an ardent enthusiasm and illimitable self-reliance; a ceaseless experimentation and almost superhuman patience; and a complete disregard of money when in pursuit of an invention.

Characteristic, typical aphorisms of Edison are: "Everything comes to him who, *hustling*, waits" and "Lived prayers are certain to be answered."

It is because of Edison, rather than of any other man, that the age in which we live is known as "The Age of Electricity." His work has con-

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tributed to the diversion, the happiness, and the welfare of the world, and it is truth both literal and figurative that he helped to bring light into the dark places of the earth.

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### THE GENIUS IN STATE MAKING

**T**HE World War, to an extent not yet wholly realized by the world, released the creative instincts of humanity. Animated by a great dream of democracy and international peace, Wilson by the sheer force of moral conviction imposed upon the world the creation of the League of Nations. Lenin engineered the downfall of a colossal and tyrannical Tsardom, and created a vast new experiment in popular government known as the Soviet Republic. Taking advantage of the chaotic and leaderless state of Italy, torn with factions and disorganized by abortive Bolshevist experiments in industry, Mussolini boldly seized the reins of leadership with courageous decisiveness, organized an impressive demonstration of force and naïve enthusiasm, and dictated his own selection as premier and virtual ruler. The dearth of genius and more particularly the lack of great leaders of men, so often and so widely deplored in our

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time, is belied by the imposing figures of Wilson, of Mussolini, and of Lenin.

Mussolini is the first journalist in history to become the ruler of a great people. Strident in manner, blatant in expression, melodramatic in pose, he has carried the methods of yellow journalism into the parliament of statesmen and into the palace of kings. He is a poseur in the grand manner, striking attitudes of imperial majesty which remind one less of Julius Cæsar than of some second-rate barnstormer. Always he dramatizes himself as the central figure of some imposing historic act: the folded arms, the glaring and protruding eyes, the dome-like forehead, the would-be terrorizing scowl: *Aut Cæsar aut nullus*. Into the lists of a strictly realistic age, unromantic, disillusioned and cynical, has ridden this new *Il Dedischado*—a renegade Socialist repudiated by his former comrades—to win a spectacular victory and to carry off the Grand Prize. This modern re-incarnation of the *Condottiere* of romantic Italy is a living contradiction to Houston Chamberlain's observation that the type of great Italians of the Renaissance is utterly extinct. For all its melodramatic cast,

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Mussolini's face—indeed the whole torso—summons imaginative fancies of the mighty days of Italy's past: of granite Rome, of turbulent Milan, of radiant Florence. But is this re-incarnation Lorenzo the Magnificent or Bartolommeo Colleoni, Augustus or Caligula?

*Il Duce*—the Chief—is a picturesque embodiment of the ideas of two of the most brilliant acute and cynical thinkers of all time: Machiavelli and Nietzsche. Each was a master of subtle and seductive thought; each was without illusions regarding the virtues of humanity; each upheld an ideal of force based upon a wilful and deliberate disregard of the conventional standards of conduct and morality, in the individual and in government. The popular conception of Mussolini as a ruthless despot, strangling liberty with an iron hand in order to perpetuate his own unstable position and imaginary grandeur, is a caricaturist's nightmare, a flagrant cartoon. Even though his manner is haughty to arrogance, though he flouts the ideals of democracy so dear to the human heart, although he tramples upon liberty with a mocking laugh and insolent gesture, although his voice and gestures are often

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crude and violent, Mussolini is yet a man of conviction and a statesman with a matured political philosophy moulded by intense study and active participation in affairs. The ideals of force, of the Will to Power, of the Superman, found realization in no Germanic leader—not in Kaiser Wilhelm II, a scuttling fugitive to Holland in the crucial hour of national *débâcle*; not in Ludendorff, mighty organizer of armies, of transport, of *matériel*; not in stolid Hindenburg, Teutonic and massively martial, conservative president of a German republic. Mussolini is the sole incarnation in national leadership today of the despotic doctrines and soaringly dictatorial ideals of Friedrich Nietzsche.

No one who has given deep reflection and study to the disquieting phenomenon which is Mussolini can doubt that the strongest power ranged against democracy in the world today is not kings or emperors, monarchies or dynasties, but a single man of destiny—*Il Duce*. He is the avowed enemy of liberalism, the dearest foe of democracy, the unashamed champion of collective despotism under the name of Fascismo.

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Mussolini is first and foremost an opportunist. Nor is this characterization made in derogation. A man of violent passions, a being revealed in his own letters as one of dangerous instincts when his anger is aroused, he has gone through life as a cynical experimentalist, a constitutional pragmatist. With an iron constitution, a relentless will, a passion for knowledge both of ideas and men, he has never allowed himself to be diverted from one central line of pursuit—the search for power. Consistency, with him as with Emerson, is an obsession of weaklings, the bane of the trivial. This son of a blacksmith, who perhaps has in his veins the blood of one of the Mussolini of Bologna who in the great days of the Italian Communes in the thirteenth century were *Capitani del Popolo*, has as his most striking characteristics audacity and self-reliance. There is something of the granite strength of Andrew Jackson in this son of the people who now, at the dazzling height of his power, with simple and magnificent arrogance declares: "I take the responsibility for all."

Literature has had no small share in moulding this grim tribune of a new people. Hugo left



*Courtesy Charles Scribner's Sons*

*Geir Munnich*



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upon him the imprint of ideals of sanity, virtue and fraternity. Stirner, Sorel, and Nietzsche fired his soul with grandiose dreams of the autonomous individualist, beyond good and evil; with glowing visions of a great race, united in superhuman ideals of strength, discipline and self-reliance; with ambitions to realize upon this earthly stage a new *Risorgimento* of imperial Rome, titanic, majestic, and august. Carducci, faithful companion of his darkest hours, surcharged his being with ardent and patriotic hopes, an indomitable passion to re-invigorate and re-animate the tottering figure of a decadent Italy. Above all, he owes his political philosophy to the great *Segretario*, Messer Niccolo Machiavelli, the much-maligned author of *The Prince*. This book, which Mussolini honors with the title of "The Statesman's Vade-mecum," originated the well-established view of Machiavelli as a crafty trickster, an unscrupulous schemer, who believed in making any sacrifice to gain the end desired. In spite of all the modern trappings of federated syndicalism and state control, its despotic rule, its forcible and frequent infringements upon personal liberty make of the Fas-

cisti an unmasked Ku Klux Klan. Fascismo is but another name for *Il Principe*. "I affirm," said Mussolini in May, 1924, "that the doctrine of Machiavelli is more living today than it was four centuries ago, because, if the external aspects of our life are greatly changed, no profound modifications are perceptible in the merits of individuals or of races." Mussolini has no faith in human nature. He regards all men as his enemies until they have proved themselves his friends, and even then he doesn't trust them. He has a contempt for women as creatures merely invented for man's amusement in hours of relaxation—although he pays tribute to their moral courage, which he regards as superior to that of men. With approbation he quotes the devastatingly cynical words of Machiavelli: "As is demonstrated by all those who reason regarding civil life, and as all histories are full of examples to illustrate, it is necessary for him who has the directing of a Republic and who has the ordering of its laws to presuppose all men to be bad and to exploit the evil qualities in their minds whenever suitable occasion offers. . . . Men never effect good actions save from necessity; but

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where freedom abounds, and where leisure can come about, everything is filled immediately with confusion and disorder.”

The true genius of Mussolini, his profound political instinct, was first displayed in 1914, when he broke violently with his party, the Socialists, on the question of neutrality. It was the flat reversal of the program and the policy he had long advocated, from innumerable platforms and in countless editorials. He felt that the state was in danger; and like Lincoln in 1860, he was resolute to make any and all sacrifices to save the state. On October 10, 1914, Mussolini wrote: “Do you believe that the State of tomorrow, Republican or Socialist-Republican, will not make war if historical necessities—internal or external—make it necessary? And who will guarantee you that the Government resulting from the revolution will not have to seek precisely in a war its own baptism? And shall you be against a war which should safeguard your revolution, our revolution? To refuse to distinguish between war and war, and to presume to offer the same kind of opposition to all wars is to give proof of a stupidity bordering

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upon the imbecile." Mussolini exhibited his sense of leadership as well as a profound political acumen first in upholding the national ideal, and in his own gallant service at the front where he was seriously wounded; and later in his realization that a resort to arms by the Fascists was the last hope of maintaining any true nationalism. He alone, in Italy, realized both the necessity and the opportunity of the hour, and in meeting both he raised himself to a pinnacle towering high above his fellows.

Italy today is not merely under the rule of a Fascist government: it is a Fascist State. Mussolini has cut the red tape of bureaucracy and replaced the fumbling hesitations of liberalism with detonating shibboleths: Order, Hierarchy, Discipline. In Italy may dwell Fascists, and non-Fascists who are loyal to the government; but anti-Fascists are exiled. The vigorous protests of Nitti and Salvemini against the despotism of Mussolini, the exposure of the workings of the ruthless military tribunals of Fascism which parallel the merciless cruelties of the Soviet Chekha, the ghastly murder of Matteotti, the atrocities which preceded the establish-

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ment of Fascism, the exile of thousands of those who oppose Fascism to a group of small islands in the Tyrrhenian sea off Sicily—alike testify to the darker side of Fascist rule. But it is futile to dispute the genius of Mussolini because he gained high place by a *coup d'état* not lacking in the usually attendant villainies and only retains that place and power by a rigid dictatorship backed by machine guns. Rejecting the Manchesterian industrial doctrine of *laissez-faire*, Mussolini has begun the organization of capital in a new form: industrial co-operative syndicalism under state direction and control. The liberty of the individual has been infringed, the liberty of the press has been curtailed. At the same time the rehabilitation of national finances, the vigorous suppression of organized crime as embodied in the Mafia and other lawless groups, and the active stimulation of agriculture and industry have been accomplished. The Fascisti—from the youths of the Balilla to the veterans of the March to Rome—have been organized into a cohesive, enthusiastic, loyal army: the supporters and champions of the State. The numerous attempts at assassination give point to Mussolini's avowed

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motto, after Nietzsche: "To live dangerously!" The Fascist State is rapidly evolving under the directing hand of Mussolini. Italy is a new nation—with grievous faults, with unendurable tyrannies.

After the March to Rome and the founding of the Fascist State, Mussolini's greatest achievement has been the signing of the Concordat with Rome. When Victor Emmanuel seized Rome on September 20, 1870, he virtually destroyed the Papal State which had survived into modern times from the days of Charlemagne. For almost sixty years the problem loomed formidably—Popes and rulers and statesmen in turn giving it up as insoluble. Since the World War negotiations had been under way to free the "prisoner of the Vatican." It was not until Mussolini took the matter strenuously in hand that a solution seemed possible. He quickly pressed matters to a conclusion—matters prepared by careful negotiations conducted by Fascist agents for six years preceding. While the solution is not ideal in all respects, it effects a long-desired reconciliation between Church and State, and imparts a deeper and more spiritual

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unity to the Italian nation. The new formula, as phrased by Mussolini, is: The State, supreme in the Kingdom of Italy; the Catholic Church, with certain pre-eminence loyally and voluntarily recognized. The concessions of Mussolini went far beyond any his predecessors could have guaranteed. Rome becomes once more, *de jure* as well as *de facto*, the capital of Catholicism; and the Pope regains his rights as autonomous sovereign. The greatest Italian statesman, prophesied Crispi, would be he who solved the Roman question. It is with these unfading laurels that the brow of Mussolini is crowned.

Mussolini stands out as the most striking and arresting figure among the rulers of the world today. Hated, feared, and idolized, he holds in his hands an absolute power unparalleled in modern days. He is not, indeed, a modern, but a re-incarnation of old Italy fortified by the sources of the new. His own idea of himself as the Man of Destiny has so impressed itself upon the world that should the history of Napoleon repeat itself in the form of Mussolini, there would be little astonishment. He has made of a small and weakened nation a great world power; and

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the fate of that nation, and it may well be, the fate of others, lies in the hands of this one man. Mussolini's dream is the restoration of the ancient power of Rome; the replacement of the easy and indolent Italian qualities by the sterner Roman virtues, and the return of a strengthened Italy to its former place among the great nations of the world.

Within the few years of his benevolent dictatorship, this dream has been in large measure realized; cleanliness and prosperity have superseded squalor and beggary; law and order everywhere prevail; slackness and inefficiency have been replaced by industry and discipline, and a weakened and vitiated people have become a strong and united nation.

If the end justifies the means, Mussolini is indeed justified. By no other methods could such results have been so quickly and definitely achieved. The methods of democracy are as slow as those of nature, since they spring from the nature of man himself. Nor could such power be wielded by a despot of the ordinary sort. The spectacular and violent quality of Mussolini's genius has captured the imagination of a tem-

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peramental and dramatic people. In the thunderous melodrama of his prose he symbolizes the power of Italy itself. He is, in his own person, the visible sign and symbol of the reign of Law. No single man, since the time of Julius Cæsar, has so definitely organized and altered a nation, and that the work is that of a single man cannot be questioned. The final result of this experiment in despotism lies in the future.

To the modern mind this reversion to the ancient plan of government by force alone, presents aspects other than the easily apparent material benefits. No nation in modern times has been more organized, more law-abiding, or more sternly disciplined than the German. Yet their drilled obedience proved unequal to the contest with the spirit of freedom in the New World. The imponderable values of liberty and freedom of spirit remain to be estimated in the final score.

Mussolini has stated his own philosophy of government in the following startling words, printed in his magazine, *Gerarchia*, March, 1923:

“Fascism throws the noxious theories of Liberalism upon the rubbish heap. When a group

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or a party is in power it is its duty to fortify and defend itself against all. The truth, manifest henceforth to all whose eyes are not blinded by dogmatism, is that men are perhaps tired of liberty. They have had an orgy of it. Liberty today is no longer the chaste and severe virgin for whom fought and died the generations of the first half of the past century. For the youths of today, intrepid, eager, stern, who envisage the dawn of a new era, there are other words which exercise a more potent fascination and these words are: Order, Hierarchy, Discipline. . . .

“Be it known then, once and for all, that Fascism knows no idols, worships no fetishes. It has already stepped, and, if need be, will quietly turn around and step once more, over the more or less putrid body of the Goddess Liberty.”

## GEORGE BERNARD SHAW

### THE WORLD'S GREATEST LIVING WRITER

**M**ORE than a quarter of a century ago, when I first recognized Shaw as a genius, he was known and appreciated by few. In a superficial way, he was classified as a pestiferous Jack-in-the-Box, suddenly popping up from time to time to give vent to gay frivolities and comic japes at capitalist society—a little Red Spectre of Socialism, looming fatuously in the void of his own inconsequence. Today, since the world-sweeping success of *Saint Joan*, the greatest play in English since the time of Shakespeare, Shaw is generally recognized as the world's greatest living writer. His voice carries round the globe. This man, once the jester at the court of King Demos, now wears the mantle of the prophet. To delight in his barbed wit and scarifying satire are now added admiration for his deft and sinewy style, respect for his gallant life of championship in behalf of a higher civilization and a finer race, and recognition of the far-reaching influence of

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his crusade for honest thinking and courageous action. Since the death of Tolstoy, no one has exercised so broad and pervasive an influence upon the life and thought of his time as Bernard Shaw.

If Shaw is the critical cross-word puzzle of the age, he is the last man in the world to help us fill in the blanks. I recall the remark of the great sculptor, the late Auguste Rodin, that, for all his genius, Shaw was not a little of a humbug. Far from indignantly repudiating the charge, Shaw frankly admits it. For nearly half a century, Shaw took a diabolic pleasure in conducting a strategic campaign of artistic camouflage. The comical creature standing on his head and waving his feet in the air gave point to Shaw's early statement, embalmed in the staid pages of *Who's Who*, that his favorite recreation was: "Showing off"! People shrugged their shoulders, uttered the irresistible bromide, "O Pshaw!"—and declared that the funny fellow was only joking. "And so I am," Shaw delightfully replied. "My way of joking is to tell the truth. That is the funniest joke in the world." Armed with the rapier of laughter, this practical

fencer got his deadly home-thrusts past the public's guard. After I had introduced Mark Twain and Bernard Shaw to each other, Mr. Shaw quizzically remarked to me: "Mark Twain and I are in very much the same position. We have to put matters in such a way as to make people who would otherwise hang us, believe that we are joking!"

Shaw began his career as an impish Bad Boy of literature—thumbing his nose and spreading his fingers out at all the cherished conventions and hallowed traditions of society. This practice became so habitual with him that even today, when it ill becomes his age and genius, he is unable to break the habit of a lifetime. He still makes an awful racket battering away at doors long since flung open by his own fierce onslaughts; he still hammers gaily away at idols long ago tumbled from their pedestals. In him we discern the eternal boy, mischievous and incorrigible.

Shaw is a double, if not a multiple, personality. "I am a soul of infinite worth," he declaims, with a mock grandiloquence. "I play many parts, but no one is more real than another."

The public mask behind which he hides his "real" self is a gaudy and incredible image which he calls G. B. S. "The whole point of the creature," he once painstakingly explained, "is that he is unique, fantastic, unrepresentative, inimitable, impossible, undesirable on any large scale, utterly unlike anybody that ever existed before, hopelessly unnatural, and void of all real passion." This is the parti-colored mask which he holds between his "real" self and the world. If the truth be known—and Shaw admits it, as I have shown—this fantastic G. B. S. is not a mere mask, but one aspect of his disposition and temperament. The other aspect is the grimly serious reformer, the Quaker, the hell-fire-and-damnationist—half Fox, half Knox. The G. B. S. rôle of Shaw embraces the pirouetting and prankish players whose names begin with a capital *P*—Puck, Pierrot, Punchinello, Peter Pan. The solemn rôle of Shaw embraces the serious and majestic realities that begin with a little *p*—publicist, puritan, priest, philosopher, and prophet. In Shaw, there is something of Swift, of Voltaire, of Barnum; and there is also something of Sophocles and of Bunyan, of Blake and Butler.

## GEORGE BERNARD SHAW

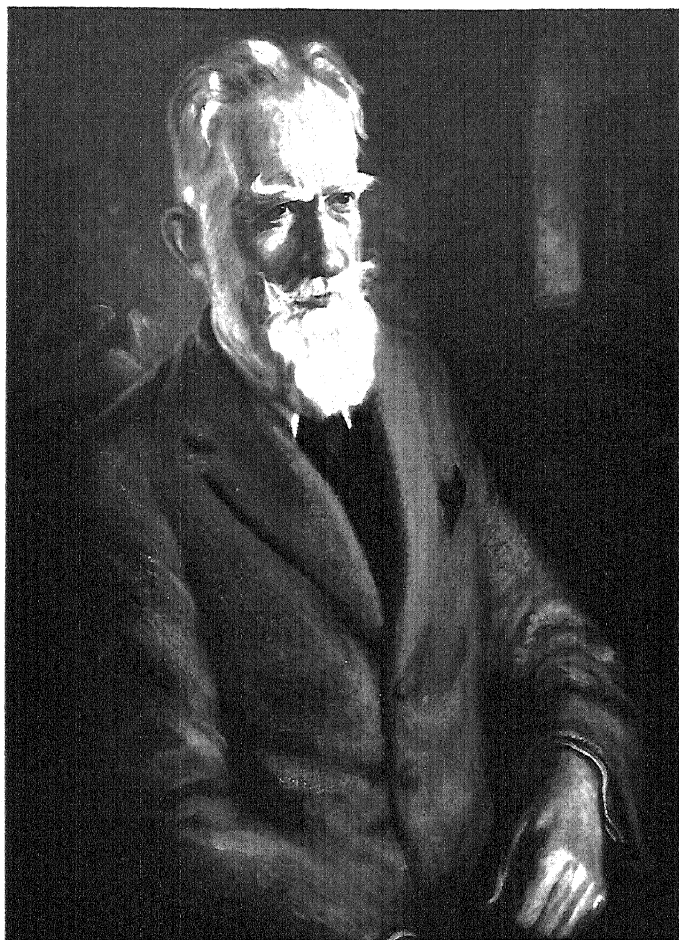
The mystifying and upsetting attribute of his duplex personality is that he is never content to remain either one for long. His most solemn utterances are punctuated with mocking laughs; in the midst of our mirth he brings us up standing with a penetrating prophecy or arresting injunction.

For the past forty-five years, Shaw has been a Socialist, a member of the famous Fabian Society of London. He is a Communist, a Social Democrat in the absolute meaning of the term. He believes in bringing everybody in the world to a common level, social as well as economic. I have often heard him say that most of the evils of our civilization might be remedied by battering down the barriers erected by social classes. In his view, a society of social inequality is a society which brings up men and women to be unsocial at every turn. "My idea of Socialism," he once remarked to me, "is to bring about a state of things in which every man in the country will be a possible husband for every woman." Furthermore he is in violent antagonism to the Robotization of mankind, threatened by the mechanizing processes of mass production. He

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is a strong contender for the Leisure State—in which the number of hours of enforced labor per day will be reduced to the minimum essential to comfort and the maintenance of individual and social needs; and the so-called leisure hours will be devoted not merely to idle recreation but to the releasing of man's creative activities and constructive instincts. Shaw is an economist of no mean ability—as his writings abundantly demonstrate. He once remarked to me that his economic studies played as important a part in his plays as anatomy does in the work of Michael Angelo. In an unpublished work of his, I once read the challenging words: "We must make a religion of Socialism. The man who believes that there is a purpose in the universe, and makes the achievement of that purpose an act, not of self-sacrifice for himself, but of self-realization: that is the effective man and the happy man, whether he calls that purpose the will of God, or Socialism, or the religion of humanity."

Incredible as it may and does seem to many, Shaw is a genuinely religious man. He is a pioneer in the group of thinkers embracing Nietzsche, Bergson, Hardy and Wells, who con-



*George Bernard Shaw.*

PAINTED FROM LIFE BY WALTER TITTLE  
LONDON, 1924



ceive God, not as a person, but as a force—the *Wille zur Macht*, the *Élan Vitale*, the Life Force, God the Invisible King—a force struggling to realize itself through humanity. Shaw's serious observation, "God makes mistakes," was laughed at immoderately as the Olympian joke of the century. But in Shaw's view this is inevitably true. For Shaw, God is neither a metaphysical toy nor a power outside ourselves that makes for righteousness. God is a force behind the universe working up through imperfection and mistake to a perfect, organized being, having the power of fulfilling its highest purposes. Shaw once remarked to a great audience, to whom he had been explaining his idea of God: "Why, just think about yourselves, ladies and gentlemen. Look around at each other. I do not want to be uncomplimentary—but can you conceive God creating you if he could have created anything better?"

Bernard Shaw is a man of extraordinary versatility, who has often excelled in what he undertook. As a novelist, he is execrable; but people persist in reading his novels, for the high percentage of wit and absurdity which they regis-

ter. He was moderately successful as an art critic; he was a delight as a music critic; and a smashing success as a critic of the acted drama. While in no sense an orator, he is an extraordinarily witty, satiric and entertaining speaker—probably without a living equal. I should not rate him as either a deep or an original thinker, but he has had many flashes of inspiration, arriving independently at conclusions embodied in systems by Nietzsche and Bergson. He is constantly bringing a new “message to the world”; and he has popularized many ideas otherwise known only to the philosophers. He has frankly acknowledged his indebtedness to Mozart, Wagner, Dickens, Lever, Samuel Butler. He once told me that he was extraordinarily adept in classifying other people’s ideas; and protested that he owed far more to his living contemporaries than to all the dead writers of the past. “I am an expert picker of other men’s brains,” he once remarked; “and I have been exceptionally fortunate in my friends.”

Shaw is almost universally estimated as an iconoclast, engaged upon destructive work of a highly useful and salutary character. From

age to age arises the need for an engineer to remove the barnacles from humanity's Ark. Shaw has been notoriously successful in removing much debris of conventional thought and outworn custom which should long ago have been thrown upon the scrap heap. A closer and more critical inspection of Shaw's writings, especially of his plays and the brilliant prefaces which accompany them, shows that his work, viewed as a whole, is in great measure constructive. Each book is a sort of personal testament on a great human question which affects the race. Thus *Candida* is Shaw's testament on love; the preface to *Androcles and the Lion* his testament on Christianity; *Man and Superman*, on eugenics and the Superman; *Major Barbara*, on poverty and wealth; *Getting Married*, on marriage; *Cæsar and Cleopatra*, on genius; *Heartbreak House*, on the conditions which gave rise to the World War; *Back to Methuselah*, on the religion of creative evolution; *Saint Joan*, on saintliness and the world. All of his writings, taken together, may be regarded as his social gospel.

For all his versatility, Shaw will be remembered chiefly by his plays. He is not a conven-

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tional playwright. Every play of his is a sort of *tour de force*, a violation, in many cases, of the conventional rules of playwriting. He turns his characters loose, and lets them have at each other. Shaw's idea of a drama is: emotion killed by ridicule, romance executed by satire. His primary purpose is to produce electric shocks in rapid succession, to startle and confound his auditors. Shaw is an instinctive reformer: his plays are, capitally, moral. He would never write a play for the sole purpose of making the auditors laugh; he wants them, before leaving the theatre, to be overwhelmed with the conviction that they are, in Hamlet's words, "guilty creatures sitting at a play." Shaw wants to show us all up for the fools we are, and to sow among us the seeds of reform. A Shaw play is the *reductio ad absurdum* of views with which he does not agree. In many of Shaw's plays, nothing "happens," in the conventional sense. They do not "get us anywhere." Yet the scenes are tense with the thrills excited by a clash of mental and spiritual actions, which is the essence of drama.

In estimating his genius, I should say that

Shaw is the full equal of Swift as a pamphleteer, of Voltaire as a wit. On the plane of fantastic comedy, with a moral purpose to sanction it, Shaw is the Molière of our time, castigating us with the knout of ridicule and the lash of satire. With full allowance for degrees of both latitude and longitude, I should say that Shaw is a sort of Irish Ibsen—riant, capricious and caustic; deeply charged with the ironic consciousness of the twentieth century.

As Shaw's plays constitute a brilliant and panoramic satire on contemporary society, so his famous "Prefaces" constitute in themselves a complete contemporary sociological literature. The terse and lucid exposition of profound and difficult economic and social problems has stripped away the confusing and turgid technicalities of the subject. Indeed the brilliant simplicity of their style might easily induce the casual reader to suppose them superficial since they may be "understood of the people," not realizing that confusion and technicality are the smoke-screen of stupidity. His *Intelligent Woman's Guide to Capitalism and Socialism* might well serve as a text-book on economics and

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as a model for the close and reasoned exposition of any difficult and far-reaching problem.

In Shaw's earlier plays there are flashes of irritating beauty. His object is, of course, to shock his audience into interest, but since his plays are interesting in themselves the shock tends rather to a feeling of regret and loss. In his greatest plays this feeling becomes often one of actual sorrow. Shaw's genius is so great that the flaws in its perfection must concern this generation and time to come.

Shaw is the dominating literary genius of this age. He might have been one of the dominating geniuses of all ages had not his brilliant talent exploited his genius in the interest of immediate recognition. He has the mind of a journalist and the soul of a poet; and in the moments when the surging passion and glory of his genius proves too great for the clever and facile self-conscious mind it sweeps into a profound and epic poetry. His plays have grown steadily in richness and in beauty—but there is scarcely one in which we are not appalled by a devastating sense of anticlimax. Their very greatness makes for a sense of profounder loss. The soul is

reverent before the revelation of Beauty; and an impropriety becomes a sacrilege. The effect is often as if a worshipper before the Winged Victory should behold her as she steps from her pedestal to don the garments and the attitudes of the Merry Widow—a highly diverting lady and a delightful one in her place—but her place is not in the soul of man or at the altars of his worship.

In the lists of intellectual combat in advocacy of purer living and larger liberty, Shaw has lived a career as full of color and romance, of excitement and thrill, as any knight-errant of the Middle Ages. He is a contemporary *Condottiere* of the human spirit. "This is the true joy in life," speak his self-revealing words, "the being used for a purpose recognized by yourself as a mighty one; the being thoroughly worn out before you are thrown on the scrap heap; the being a force of nature, instead of a feverish, selfish little clod of ailments and grievances, complaining that the world will not devote itself to making you happy."

The passionate integrity of Shaw's inner conviction is the mainspring of his life, and all his

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brilliant powers have been devoted to the service of humanity. His clear and unilluded vision has seen life stripped of all its roseate glamour and has uncovered its masked ugliness for all men to gaze upon. He neither gloats over the spectacle of an earth that is sick in soul and body, nor averts his eyes from the sight. He is a pragmatic dreamer with a practical program. Behind his clear, cold purpose lies the dream—a dream that is voiced repeatedly through all his plays in phrases of unforgettable and incomparable loftiness and beauty. Nowhere, perhaps, has it been expressed more simply and more frankly than by Father Keegan in *John Bull's Other Island*.

“Every dream is a prophecy”: heaven “in my dreams is a country where the State is the Church and the Church the people: three in one and one in three. It is a commonwealth in which work is play and play is life: three in one and one in three. It is a godhead in which all life is human and all humanity divine: three in one and one in three. It is, in short, the dream of a madman.”

## GUGLIELMO MARCONI

### MASTER OF SPACE

ON December 12, 1901, an impassive young man of twenty-seven years, with calm face but brilliant eyes, was seated at a little table in an old barracks on Signal Hill, near St. John's, Newfoundland. Before him on the table was a sensitive receiving instrument, the culminative product of years of inventive ingenuity. A wire ran from the instrument through the window to a large kite, swaying four hundred feet aloft in a high, blustery wind. With a telephone receiver to his ear, the young Italian inventor, Marconi, patiently listened, while his assistant, Kemp, was almost frenzied with excitement. The hands of the clock showed noon. It was the zero hour!

Two thousand miles away, an excited staff were gathered around the operator at the great wireless station at Poldhu, Cornwall. With the transmission of the signal—the three dots that in the Morse code make the letter *S*—the little building at the foot of the ring of great masts

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supporting the aerial shook with the crash of the blinding sparks.

Calm and impassive, Marconi sat on Signal Hill for many minutes listening in on the receiver. Then a gratified smile illuminated his face. Handing the receiver to his assistant, he said: "See if you can hear anything, Mr. Kemp?" A faint sound, like a tiny echo, came over. Was it an accident—or the fruition of a great dream? Was it only some atmospheric disturbance, an oscillation of the kite, or the hapless flight of an insect against the suspended wire? But no! it was unmistakable: three little clicks, faint but distinct. The impossible had been accomplished. A wireless message sent through the ether with the speed of light had crossed the Atlantic Ocean. It was one of the great moments of history.

Marconi was not the discoverer of the principle of wireless. His genius is akin to that of Edison: the ingenious co-ordination of antecedent inventions and discoveries, the contribution of his own thinking to the problem, and the patient perfecting of all the instrumentalities available until the invention is made a practical,

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commercial reality. When Edison heard the news of Marconi's success, he humorously remarked, with robust egoism: "Marconi has a mind like my own. Marconi is the man!"

Indeed, when Marconi was attracting wide attention in England in 1897 with his successful wireless experiments over short distances, he explicitly disclaimed being a "scientist." Although he modestly disclaimed being a scientist—and of course neither he nor anyone knew very much of the mighty forces and silent media dealt with—nevertheless he was proceeding in his researches with the true scientific spirit and utilizing with extraordinary astuteness all the discoveries already known to science, bearing upon the great problem of wireless transmission.

Marconi was born at Villa Griffone, near Bologna, on April 25, 1874. As a young lad, he pursued his studies with pertinacity and determination, exhibiting all the marks of the thinker and investigator. From the age of twelve onward he was an ardent amateur student of electricity; and at the age of twenty he began to experiment with electric waves on his father's estate at Bologna. Born of an Irish mother and

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an Italian father, he is thought to have inherited his persistence, initiative and alertness from his mother, his power of invention and conception from his father. Marconi learned from his mother to speak English fluently; and though for the most part educated in Italy, he spent some time at English schools, at Bedford and at Rugby. At Leghorn, he studied under Professor Rosa; but his chief stimulus to electrical research came at the University of Bologna from Professor Augusto Righi, who had carried forward the researches of Heinrich Hertz, making contributions of his own and inventing various types of wave producers.

Marconi did not discover electric waves, nor did he invent a single portion of the apparatus which made wireless telegraphy possible. So much was known about the subject when Marconi began his serious experiments that he expected at any time, for several years, to read the announcement that the problem had been solved. When such an announcement did not come he bent all his energies to the great task.

Clerk-Maxwell had mathematically demonstrated the electro-magnetic theory of light in

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1864, and Heinrich Hertz had experimentally shown in 1888 that electric waves could be transmitted over considerable distances through free ether. Marconi was able to make use of these discoveries and enlarge the domain of knowledge concerning the unsolved problems of transmission and reception for waves traversing long distances. (More than half a century before Marconi began his serious experimentation, Professor Joseph Henry, the famous American scientist, had shown that the magnetic effects of a spark could be shown thirty feet away.) Four years earlier, in 1838, K. A. Steinheil of Munich, on the basis of discoveries he had made, suggested the possibility of wireless telegraphy in the future. In the year of Henry's discovery, Samuel F. B. Morse succeeded in sending messages across a canal at Washington, utilizing the slight conducting power of the water to carry the electric telegraph current from one side to the other. Morse transmitted messages nearly a mile; and although others followed in his footsteps, no serious effort was made during this period to turn these scientific experiments to practical or commercial use.

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It has been claimed for Professor John Trowbridge of Harvard University that he was the "grandfather of wireless telegraphy." He demonstrated that electric currents will travel some distance through the earth; he revived the notion of telegraphing long distances, such as across the Atlantic Ocean, by utilizing the conductivity of the sea-water to carry the currents; and boldly prophesied in 1880 that wireless messages would be sent through the air at no distant date. His experiments on induced currents pointed the way to wireless telegraphy, and showed him to be a forerunner of Marconi, De Forest and Fessenden. Edison and his associates in 1885 perfected a system of train telegraphy between stations and trains in motion, which was, as he himself asserts, "the forerunner of wireless telegraphy." This system was later installed on the Lehigh Valley Railroad. At this time Edison succeeded in transmitting messages through the air a distance of five hundred and eighty feet, and by means of kites, a distance of two and a half miles. By failing to make use of the results of his experiments on "etheric force" in 1875, which by a singular



*Photograph by Underwood & Underwood*

*G Marconi*



mental lapse he happened to overlook, he would have had, according to his own contention, wireless telegraphy in the late 1880's.

In 1882 both Alexander Graham Bell in the United States and William Preece in England transmitted messages from a mile to a mile and a half, by the principle of induction and of "cross talk" between neighboring circuits carrying telephone and telegraph messages by wire. Loomis, Dolbear and Kitsee made valuable suggestions, chiefly along the line of induction; and Oliver Lodge in England succeeded in transmitting signals through the ether for short distances two years before the epochal achievements of Marconi. In 1890 Professor Edouard Branly of the Catholic University of Paris invented a successful "coherer," on the basis of the experiments of the Englishman Varley in 1870, and the later work of the Italian scientist, Professor Calzecchi-Onesti. In 1894, by combining the Branly coherer with the Hertz oscillator, Professor Oliver Lodge of Birmingham actually formed what is historically the first real wireless set.

By 1896—on the basis of the discoveries and inventions of Henry and Hertz, of Branly and

Calzecci, of Righi and Lodge—Marconi had brought his system of wireless to an advanced stage of successful operation. The principle is now familiar to all—the setting in motion by means of a transmitter, electric waves which, traversing the ether, are received on a distant wire suspended from a kite or mast, and registered on a receiving apparatus. Marconi had assembled the devices which had remained chiefly scientific toys in the hands of others, and coordinated them into a workable system of communication. For this great achievement, he will always hold the honor of being the inventor of the wireless telegraph. His richly deserved laurels are unfading.

On June 2, 1896, he personally applied for a patent on his invention in England. Through the effective co-operation of Sir William Preece, who only the year before had succeeded in establishing wireless communication between Oban and Mull, Marconi carried out successful experiments with his apparatus set up in the General Post-office in London. Next, he carried out his famous experiments on Salisbury Plain, establishing communication between stations two miles

apart. From this time forward, Marconi's progress was little short of phenomenal. On March 27, 1899, wireless messages were transmitted across the English channel from Folkestone to Boulogne. On January 23, 1901, he sent waves one hundred and eighty-nine miles, from the Lizard to St. Catherine's, on the Isle of Wight. The success of this experiment went far toward convincing the public of the truth of Marconi's assertion that the waves of sound would not be intercepted by the curvature of the earth's surface. Soon Marconi was sending messages to Italy; and in 1901, as already mentioned, trans-Atlantic communication was established. On January 19, 1903, the first "official" wireless across the Atlantic was sent by President Roosevelt to King Edward VII. Today wireless messages are transmitted halfway round the world. On account of the influence of the position and altitude of the sun, the waves from England during the morning travel to Australia in a westerly direction following the great circle, along the longest route, which is approximately fourteen thousand miles, whereas during the afternoon and part of the night the waves travel best

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in an easterly direction following the shortest great-circle route, which is about ten thousand miles. In Shakespeare's *A Midsummer-Night's Dream*, Puck fantastically declares to Oberon: "I'll put a girdle round about the earth in forty minutes." Not long ago Marconi, who is given to prediction regarding the future of wireless, observed: "I believe that in the near future a wireless message will be sent from New York completely round the world without relaying, and will be received by an instrument in the same office with the transmitter, in perhaps less time than Shakespeare's forty minutes."

By accomplishing the miracle of long-distance wireless transmission, Marconi touched the imagination of the world as a modern Merlin, a "wizard of wireless." This was an achievement which might well have satisfied the inventive aspiration of any scientist. But Marconi has never relaxed in his effort to perfect the new marvels, to make new applications of wireless, to enlarge the scope of his invention for the greater general happiness and service to mankind. Toward the American people he has always cherished warm feelings of gratitude and admiration, both for

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the encouragement and support given him on his first historic visit to this country, and for the remarkable development of radio, which is primarily due to American initiative, efficiency and inventive genius. Few great discoveries have had such a phenomenally rapid development as radio. So remarkable were the technical improvements in apparatus in the course of two decades after the historic incident in 1901 that Marconi himself recently observed: "The instruments we had at our disposal were very crude compared to those that exist today. We had no vacuum tubes, amplifiers, sensitive super-heterodyne sets, directional transmitters and receivers, or means for making continuous waves. All we had was a means of making crude damped spark waves which did not permit the correct tuning we have available today." When that *S* signal fluttered across the Atlantic from Poldhu, it was literally roaming through space; and now, in these days of the directive beam, its interception by Marconi, with his crude instruments, appears all the more remarkable.

The contributions of Marconi to the service of mankind were only inaugurated by the perfec-

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tion of long-distance wireless transmission. No estimate can be made of the benefits to humanity of the use of wireless for saving lives at sea. From the outset Marconi devoted his strenuous energies to bringing wireless into general use on sea-going vessels. In the beginning general scepticism on the part of both the scientific world and the general public greeted his prediction that eventually every ship would be equipped with wireless. The first use of radio for this purpose occurred thirty years ago, when the steamer *R. F. Mathews* and the East Goodwin Sands Lightship collided. Had a wireless apparatus been installed, the great disaster of the sinking of the French liner *Bourgogne*, with the loss of almost every soul on board, would doubtless have been averted. To the present generation, the most stirring chapters in recent maritime history are aglow with the heroism of the wireless operators—Binns on the *Republic*, Phillips on the *Titanic*, nameless heroes on the *Baltic*, the *Principessa Mafalda*, and innumerable other craft, particularly during the desperate sea fights of the World War. Today it is a commonplace—but one of incalculable significance, which the

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world owes primarily to Marconi—that every ship carrying fifty or more persons, including the crew, is required to carry radio within the territorial waters of the United States. Marconi has invented a remarkable automatic *S O S* which, by means of a switch set at a third position controlling a special receiver set to the *S O S* wave, rings in the operator's absence when the distress signal is received; and continues to ring in the operator's office and at other points on the ship, until the operator returns to his cabin and pulls the switch, cutting in the ship's wireless.

Another striking invention by Marconi is the radio lighthouse, which enables a navigator to locate his position by wireless. The lighthouse, which uses the short wave, directional transmission perfected by Marconi in 1922, has sixty-four radiating positions. By identifying the particular one of these positions by means of the call, the navigator gets his direction; and the strength of the signal gives him the distance. The radio compass, constructed on this principle, has recently abundantly demonstrated its value in aviation and marine radio. Other important

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inventions of Marconi are the magnetic detector and the horizontal directional aerial.

The most important of Marconi's inventions since 1901 is the perfection of short wave transmission by the use of the directive beam. This important invention is one of Marconi's triumphs, achieved after the loss of an eye in an automobile collision in 1912. It is an illustration of the extraordinary "reversal of form" which radio has recently exhibited. At first radio transmission was much better at night than in the daytime; but today, through improved methods, the exact reverse is the case. Once radio worked better in high latitudes, but now it operates more effectively in the tropics. Today long-distance transmission is easier and simpler than transmission at short range—the exact opposite of earlier experience. Contrary to former practice, newer methods are more effective in long-distance radio transmission over land than over sea.

In his original classical experiments, Hertz used only short waves. Marconi followed him in this respect, but quickly had recourse to longer waves to communicate over greater distances.

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In 1916, Marconi, aided by his associate, C. S. Franklin, began a series of experiments with short waves. Just as light rays radiate from a source of light with equal intensity in all directions, so also do electric waves. It is for this reason that the term "radio" came into being—a term which has now largely superseded the term "wireless." Without the employment of some directive device, electric waves will spread out and in consequence be largely dissipated in force. By the invention of a parabolic reflector, the electric waves are directed all in one direction and consequently effect a great increase in power. This system has been adopted by the British government for communication with the dominions. The improvements effected by the new directive beam will enable a letter to pass from transmitter at London to receiver in Australia in one-eighteenth of a second. As many as three hundred and twenty-five words per minute in both directions have been sent simultaneously over the Australian beam.

It is one of Marconi's naïve traits to disclaim, vehemently, any disposition to enter the realm of prophecy. Yet he has won a reputation for

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rashness by his repeated and usually spectacular predictions. He has been called an "insane dreamer"; but, by minute knowledge of the status and development of radio, he has been able to realize Kipling's ideal:

If you can dream and not make dreams your master.

Time abundantly justified his prediction, on March 18, 1914, that the "problem of the wireless telephone, or wireless telephony, has been practically solved." In anticipation of the perfection of his system of beam transmission, he predicted in 1922 that the radio apparatus of that day would be scrapped as obsolete within ten years—a prediction "rash" only in the too brief duration of time set for the revolution. He predicted facsimile transmission, television, and the revolutionizing effect of short-wave transmission. Today he predicts regular trans-Atlantic flying service, in which the aircraft will "place their chief reliance upon the guiding finger of the radio beam"; a great development in the control of mechanism at a distance; and the transmission of power by radio as a strong possibility of the future. This oracle of wireless, who is nothing

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if not "televisionary," predicts the early success of radio in transmitting over great distances and throwing upon the screen actual pictures of current happenings. These televisions will far surpass in interest the present news-reel features, since the events recorded on the screen will be news. The spectator will have all the thrill and suspense which come from viewing in real life an incident, a contest, an event, the outcome of which is problematical. Regarding the popularity of a device to permit two persons at opposite ends of a telephone line, either a wire or a radio beam, to see each other while they talk, Marconi recently observed: "That seems to me of doubtful utility. I can imagine many circumstances, indeed, in which it might be very embarrassing to one or both parties."

Of swarthy complexion, blue eyes and light hair, Marconi is more English than Italian in appearance. Intensely alert, highly efficient, he is exceedingly jealous of his time and energy. He has the manner of a high-strung American business man, speaks perfect English, and suggests nothing of the dreamer. But seen on his

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yacht, *Elettra*, surrounded by electrical devices—receiver to his ear, blue eyes fixed upon some imaginary point in space—we begin to understand why he is called a dreamer—a great scientist who has made, and is still making, his dreams come true.

In 1903, Senator Marconi met and fell in love with the Honorable Beatrice O'Brien, daughter of the fourteenth Baron Inchiquin. Chiefly because of the mother's objection to indissoluble marriage, Marconi, who had been baptized as a Catholic but educated as a Protestant, made a pre-nuptial agreement waiving his rights as a Catholic to insist upon the indissolubility of the marriage.

The marriage was celebrated with Anglican rites in St. George's Church, London, in 1905. There were three children of this union. Twenty-odd years later, Senator Marconi and his wife obtained a civil divorce at Fiume; and an application for nullification was presented to the Archdiocese of Westminster. One of the reasons advanced by Senator Marconi in the plea for nullification was to please his wife, who desired to solemnize in the Catholic Church her

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marriage to the Marquis Marignoli. In May, 1927, on the ground that a pre-nuptial agreement is contrary to the sacrament, the Tribunal of the Sacred Rota granted the decree of annulment under Canon 1085, "which invalidates any marriage in the contracting of which there has been a positive act or will tending to conflict with any inherent qualities of a Catholic marriage."

On the afternoon of June 12, 1927, Senator Marconi was quietly married, in a civil marriage ceremony, to Countess Maria Cristina Bezzi-Scali, a young and beautiful member of an old Roman family of papal aristocracy. The marriage ceremony was performed by Prince Spada Potenziani, Governor of Rome, in the beautiful hall of the Capitol. On the following Thursday morning, the religious ceremony was performed in the Royal Church of Santa Maria degli Angeli by Cardinal Lucidi.

Marconi is recognized today as Italy's greatest scientist, in the classic line of scientific descent from Galvani and Volta. (The Nobel Prize for physics (1909), the Albert Medal of the Royal Society of Arts (England), and the

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Franklin and the John Fritz Medals (United States) have been awarded him. In 1909, he was nominated by the King of Italy to be a member of the Italian Senate; and for many years he has been regarded as one of the most distinguished of Italian citizens. Very recently the title of Marquis was conferred on him by the King of Italy. During the World War he served in both the Italian army and navy, was a member of the Italian war mission to the United States government, and served as a plenipotentiary delegate to the Peace Conference in Paris, signing on behalf of Italy the peace treaties with Austria and Bulgaria.

The future of radio is immense. Marconi dreams of a future world run by wireless. No industry of recent years has developed with such phenomenal rapidity. Marconi gives generous credit to the United States for the tremendous stimulus given to the radio industry, in particular praising the vast American army of youthful experimenters. Marvellous as are the achievements of radio, they give promise of far greater marvels in the future. Trusting to the

## GUGLIELMO MARCONI

genius of Marconi, De Forest, Alexanderson, Fessenden and their compeers, the world looks confidently forward to the achievement of successful television long before the year 2170, when Bernard Shaw, in his *Back to Methuselah*, has a British Prime Minister press a button and see a Cabinet member "recreating" on the Riviera. Only the other day, Marconi ventured once more to overcome his invincible repugnance to prophecy:

"What has been accomplished is the extension of our somewhat limited senses. Today we hear and speak to one another halfway around the world; tomorrow we shall see one another through mountains and across oceans. Here is a new means of communication, unlimited in its scope and possibilities, against which no frontiers can form a barrier to the most precious of all human privileges—the free and unrestricted exchange of ideas. And that, I maintain, is the only force to which we can look with any degree of hope for the ultimate establishment of permanent world peace."

The pitch and reach of America's admiration for the Italian's triumph are voiced in the first

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stanza of William Aspenwall Bradley's poem,  
"Marconi":

Who says Italia holds a dying race  
And all the glory of her line is spent?  
This western world is still her monument  
No less than when the Genoese did trace  
The trackless ocean and Spain's banner place  
Upon our strand. For, hark! the air is rent  
With strange turmoil, a mystic hail is sent  
To us by her last born who conquers space.

## JANE ADDAMS

### GREAT HUMANIST AND PHILANTHROPIST

A YEAR or two ago a journalist made a long journey to ask Bernard Shaw a question. The editor of a great metropolitan newspaper, so the story goes, conceived the idea that it would be of great interest to the world to know who, in Shaw's opinion, were the most precious, the most indispensable individuals now living. Suppose the human race was suddenly to be wiped out, with the exception of half-a-dozen people, who should be saved, in order to begin once more the great struggle for existence and the long upward march toward civilization? So the journalist put the question to Shaw: "Suppose you were the Noah of a new dispensation, and had a prevision of a coming flood that was going to engulf the world, whom would you save?" With a half-quizzical smile and a look of abandoned despair, Shaw replied: "I'd let them all drown."

I often heard Mark Twain, in the latter years

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of his life, voice the most hopeless pessimism in regard to the human race. Long before publicly acknowledging its authorship, he presented me with a copy of his *What Is Man?* which throbs with a sense of despair over the weakness of humanity, which he regarded as irremediable. Shaw would let them all drown, as would Nietzsche likewise have done—regarding the human race as a mere link in the evolutionary chain—amoeba, shark, bird, dawn man, man, superman, angel, archangel, and then omnipotent God. Tolstoy voiced a loss of faith in civilization and progress, judged in terms of improvement in living conditions and marvellous inventions for utility, recreation and nature conquest, so long as Man himself remained the same. However long either civilization or progress may continue, he once wrote, they cannot improve the state of mankind unless men themselves alter.

It has been said of Jane Addams by a discriminating writer that “the reach of this woman’s sympathy and understanding is beyond all comparison wider in its span—comprehending all kinds of people—than that of any other living person.” Here is no faddist with glib

panaceas for human ills. Here is no eugenicist with grandiose dreams of improving the human race through dehumanizing projects of selective breeding. Here is no dilettantist with half-baked projects for social betterment, racial improvement—companionate marriage and the like, untried social programs which end in *ism*, inhibitory schemes and reformatory measures which suppress human instincts and repress human aspirations. Jane Addams has mingled freely and easily with individuals of innumerable races and colors; with thinkers and pseudo-thinkers, sciologists and reformers representative of every shade of social, political, and religious view; with publicists, educators, statesmen, rulers—from the hard-boiled journalist of the yellow sheet and the cynical ward-politician and local boss to the secret and powerful emissary of a great ruler and the first men and women of all the world. Socialists, communists, anarchists have found her their friend; burglars, prostitutes, murderers have known the healing spirit of her sympathy; incorrigible youths, wayward girls, irredeemable failures have been touched to finer issues and stirred to fresh efforts through the ministering

warmth of her tender humanism. But none of them could claim her for their own, as limited to some special *ism*, some restricted code, some narrow-chested conception of the baffling human problem. Jane Addams was never "regular." She followed the inner promptings of some wise genius which told her that the way of life, the path to humanity's heart, lay not in creed, formula, or doctrine, but in vision, sympathy, understanding, and active, unpatronizing helpfulness. If I might find her creed in words other than her own, I should grasp at the pregnant words of Tolstoy: "To recognize the will of God in one's self and to do it."

The imagination of the world is always gripped and held by lofty exhibitions of the sacrificial and the selfless. Father Damien, Grenfell, Walter Reed, Tolstoy, Gandhi—each, in his own way, counted the world well lost for a service to humanity, not only that of immediate value, but that of permanent influence as an "ensample of Godly life." To labor for the alleviation of the incurably diseased, to take up the cross of complete self-renunciation, to offer one's self as a possible or probable "martyr to science," to for-

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sake wealth and take vows of poverty for the benefit of the poor and the oppressed, to sacrifice earthly dignities, silken comfort, gracious ease for the laborer's smock, the plow, the menial task—this it is to be saintly, to follow Christ, to do the will of God.

Jane Addams is one of the saintly characters of history. She belongs to the sisterhood of Catherine of Siena, Joan of Arc, Florence Nightingale, Edith Cavell—who have made the supreme sacrifice of self that others may profit by that sacrifice. John Burns called Jane Addams "the only saint that America has produced." In estimating her character it would be a fatal error to confound selflessness with weakness, gentleness with softness or lack of independence. Jane Addams is a personality of great force, the more effective for its quietude; a character of quite ruthless determination in carrying out, along lines conformable to her judgment and conscience, her crusade for social betterment and humanistic living. She is equally resolute in refusing to be controlled by the glittering but self-interested advice of the capitalist and in declining to have her views dic-

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tated by the theories of the oppressed but often wrong-headed workingman. In addition to everything else, Jane Addams is a scholar of distinction, a notable student of economics and sociology, especially from the standpoint of social relief, and a student of international affairs whose courageous pacifism is leaving a deep mark upon the consciousness and the conscience of her generation.

Jane Addams is a humanistic liberal who has absorbed the best thought of the past, the most constructive contributions of the present, without becoming either a visionary or a doctrinaire. She is a sane radical, who not only goes to the root of the matter, but enters the heart of the trouble and camps there for life. A grave spinal trouble, which developed early in life, inspired in her an acute sensitiveness. This sense of pity and selflessness came to the surface in an extraordinary incident of her early life. At the age of seven she accompanied her father to a mill settlement, and had her first sight of the poverty which implies squalor, and felt the curious distinction between the ruddy poverty of the country and that which even a small city presents in its shabbiest



*Photograph by Moffett*

*Jane Anderson*



streets. "I remember launching at my father the pertinent inquiry why people lived in such horrid little houses so close together, and that after receiving his explanation I declared with much firmness when I grew up I should, of course, have a large house, but it would not be built among the other large houses, but right in the midst of horrid little houses like these." She did not intend to live in selfish communion with other rich people who had comfortable big houses; she was going to live among the poor who had horrid houses.

Deeply sealed upon her youthful nature was a consciousness of Lincoln and all that he had meant to America and the world. Her father had known Lincoln in the days of his obscurity, and held him—as she came in time to hold him—to be the greatest man America has produced. She heard read the letters to her father, whom Lincoln addressed as "My dear Double D'ed Addams"; and knew somehow that one of the true secrets of Lincoln's greatness was his love for the people, whom he earnestly strove to understand. In the people, she dimly sensed, Lincoln recognized the root principle of that

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new humanism called democracy which he had so faithfully striven to make prevail. Little Jane, who had intended to become a doctor and in this way to alleviate human suffering, ultimately abandoned medicine in favor of a larger plan of human betterment more suited to her own powers.

Many influences helped to mould the character and shape the life of Jane Addams. Facing the darker realities of life, in illness; visiting the London slums and witnessing the scarifying spectacle of human animalism due to the pangs of sheer hunger; travelling and studying abroad, only to be constantly diverted from intellectual pursuits by depressing scenes of human slavery—she was, as she confesses,

Weary of myself and sick of asking  
What I am and what I ought to be.

Like a character in one of Granville Barker's plays, she ultimately came to feel that comfort, prosperity, beautiful clothes and a gracious life were unendurable while there were so many other people living in the world whose lives were cheerless, empty and tragic, since they were de-

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prived by some inscrutable dispensation of like advantages. She came under the influence of the Settlement movement in England and received a further stimulus through the friends and co-workers of Arnold Toynbee, the example of Ruskin and Maurice, the teachings of Frederic Harrison, Prince Kropotkin and Count Tolstoy, the theories and findings of Mill, Lecky, Matthew Arnold, Sidney and Beatrice Webb. Revolutionary in its influence upon the course of her life was the realization, which suddenly dawned upon her, that there is *not*, as imagined by a young character in one of Wells's novels, a body of authoritative people who will put things to rights as soon as they really know what is wrong. Just forty years ago, after five years of imprisonment in the "snare of preparation," Jane Addams found herself at Toynbee Hall, highly resolved to give herself that others might not suffer.

Jane Addams has delivered countless lectures, written innumerable articles, published many books. Her masterpiece is her life, faintly limned in the memorable book, unsurpassed in tender and unobtrusive humanism in our time:

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*Twenty Years at Hull-House.* With all deference to the many selfless and heroic workers who have aided her, it is no hyperbole to say: "Hull-House—that is Jane Addams."

The whole world knows the story of Hull-House, founded by Jane Addams and Ellen Gates Starr in 1889—in a building, once the home of one of Chicago's pioneer citizens, Charles J. Hull, near the junction of Blue Island Avenue, and Halsted and Harrison Streets. Here during these years it has stood as an oasis of cheer and relief amid a desert of lowliness, poverty, crime, disease and squalor, a bright island of refuge surrounded and beaten upon by tumultuous waves of the benighted foreign-born, the aspiring but inarticulate, the ambitious but untutored—Irish, Russian, Polish, Italian, all the miscellaneous flotsam and jetsam cast upon our shores, *je ne sais quoi du tout*. The genius of this gracious asylum is no cloistered nun of medieval remoteness, pent in some ivory tower of selfish sanctity. Jane Addams is a saint of the valiant line—Saint George, Saint Hubert, Saint Joan—who has striven desperately in the dusty arena, borne patiently the mud flung by her as-

sailants, fought the good fight in behalf of just laws, the square deal, and a human dispensation for the poor, the outcast, and the downtrodden. She has borne at times, with indignant equanimity, the obloquy of sharing the views and defending the doctrines of "harlots and sinners." So battered at times became her garments, in her preoccupation with others' welfare, that her adherents once held a meeting to demand that she buy a new hat! So tender-hearted is she that once, when she awakened to find a burglar in her room and he fled toward the window, she quietly urged him not to risk a limb but to depart by the door—which sensible advice the burglar judiciously followed! So independent is she that once when she was advocating legislative relief for the sweated garment workers and the representatives of a group of manufacturers offered to donate fifty thousand dollars for her settlement if she "would drop all this nonsense about a sweat-shop bill of which she knew nothing," she replied in level tones: "We have no ambition to make Hull-House the largest institution in Chicago; but we are trying to protect our neighbors from evil conditions; and if to do that, the

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destruction of our Settlement should be necessary, we would gladly sing a Te Deum on its ruins."

A mere catalogue of the activities, social, political, educational, economic, religious, humanitarian, carried on at Hull-House would prove helpful in itself. Yet it would still leave unmentioned the thousand acts of mercy, the innumerable deeds of kindness and personal helpfulness which have made Jane Addams so beloved. Some warm, sixth sense of humanity—the spirit of youth, the impulse to happiness, the recreational instinct, the will to procure equalization of human joys and opportunities—saved Hull-House from being a mere social center or expression of "social extension," with barren educational policies and futile religious panaceas. Here always are found in rich abundance the familiar features of settlement life: feeding the hungry, ministering to the sick, giving comfort to the aged, activities for improvement of laws regulating labor and living conditions. Inspiring all these conventional activities was a rare consciousness of the people's need for happiness, for a vital understanding of the meaning and the lived

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reality of democracy, a genius for creating, amid the squalor of poverty and the ever-present menaces of a great city, an independent social life for the people of the neighborhood. Through bringing to bear the results of cultivation and training upon the life of Halsted Street and the submerged laboring classes of Chicago and providing channels through which the aspiration, faith and moral force of the individual might flow, Jane Addams made Hull-House approximate closely, as Sir Walter Besant once said, to his ideal of the "Palace of Delight."

Within the past two decades the maternal instinct and fostering care, which expressed itself freely in the limited environment of Halsted Street, Chicago, and spread its far-reaching influence upon all movements for social betterment of whatever kind, has found world scope in the cause of pacifism and international agitation in behalf of peace. In April, 1915, at the call of prominent women of Holland, the International Congress of Women, attended by women from fourteen countries, was held at The Hague. This congress formulated an eminently sensible plan for continuous mediation; and Jane

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Addams headed that one of the two commissions appointed by the congress which visited Holland, England, Germany, Austria, Hungary, Switzerland, Italy and France. This commission met with surprisingly warm response, save in France and Italy; and while the Congress did not accomplish anything decisive in curtailment of the war, it focused the attention of the world upon the women's instinctive protest against war and their sanely thoughtful proposal for a settlement upon a basis more rational and just than that of force. It was the hope of Jane Addams and her fellow-workers that ultimately, to use her own words: "Out of the present situation, which certainly 'presents the spectacle of the breakdown of the whole philosophy of nationalism, political, racial, and cultural,' may conceivably issue a new birth of internationalism, founded not so much upon arbitration treaties, to be used in times of disturbance, as upon governmental devices designed to protect and enhance the fruitful processes of co-operation in the great experiment of living together in a world become conscious of itself."

In a moment of illumination, facing the sen-

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tence of death, Edith Cavell uttered the immortal words: "Patriotism is not enough." In a moment of illumination, facing the immitigable terrors of life, Jane Addams said to herself: "Sympathy is not enough." To wipe away the tears of things, to irradiate squalor with beauty, to lift up the fallen and oppressed, there was but one answer: to give herself. To Jane Addams, there was a regenerative truth in the resolving human cadence: "Labor is the house that love lives in." In Botticelli's "Fortitude," a poet has divined Jane Addams:

The worn, waiting face;  
The pale, fine-fibred hands upon the mace;  
The brow's serenity, the lips that brood,  
The vigilant, tired patience of her mood.

## ORVILLE WRIGHT

### CONQUEROR OF THE AIR

**I**N the town of Dayton, Ohio, one day a tall, imposing-looking man walked into a bicycle shop. There his two sons, Orville and Wilbur, with serious mien and set faces, were working over the parts of a dismantled machine. "Boys," said Bishop Wright, "I wish you would quit your foolishness and stop tinkering with that old flying-machine. You are not going to fly—no one is ever going to fly—so long as the world stands." And then, with a touch of added impatience: "Even if anybody ever does invent a machine that will fly, it certainly won't be anybody from Dayton, Ohio!"

These two solemn-visaged men achieved the miracle of the ages, belied both prophecies of their father, and gloriously demonstrated that if anybody ever *was* going to fly, it would be none other than two obscure bicycle-makers from Dayton, Ohio!

The marvellous scientific feat of the Wright

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brothers has brought them an undying fame. Their immortality, as judged by human standards of inventive achievement, rests not alone upon the manufacture of a mechanism, driven by a motor, that could carry a man and fly through the air. Many inventions, numerous mechanisms, past and present, are far more complicated and intricate than the Wright airplane. [The real significance of their achievement lay in the realization of a dream which has obsessed the imaginations of men since the dawning of the world. It was the culmination of the myriad attempts, prosecuted by the inventive instinct of mankind throughout all history, to overcome, by means of machinery, the silent recalcitrancy and inevitableness of the law of universal gravitation. } It was the ingenious discovery of various hitherto unknown scientific data, their successful combination in workable harmony, and the final integration in the form of a machine that was a magic extension of the normal faculties of man. It was the discovery of the means whereby man might navigate a new domain in a new way. It was, literally, the conquest of the air.

Never before, in the history of the world, have

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two individuals so completely merged themselves into one thinking organism for the achievement of an epochal invention. (There is no way to assign credit to one brother for certain contributions, to the other brother for certain other contributions, toward the perfecting of the concept of the airplane.) The brothers worked together, thought together, disputed together, achieved together.) Many of the scientific laws and principles governing flight, wind-pressure, balance, centre of pressure, control and other obscure atmospheric phenomena were either entirely unknown, imperfectly understood, or incorrectly recorded. When they came to investigate the problem of the type of propeller suitable for their machine, they found themselves confronted with almost inconceivable difficulties. "With the machine moving forward, the air flying backward, the propellers turning sidewise, and nothing standing still," they have quaintly recorded, "it seemed impossible to find a starting point from which to trace the various simultaneous reactions. Contemplation of it was confusing. After long arguments we often found ourselves in the ludicrous position of each having been

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converted to the other's side, with no more agreement than when the discussion began."

For a quarter of a century, I have studied with the deepest interest everything pertaining to the Wrights and their invention. Before I had ever heard of the Wrights, I was absorbed in the experiments being conducted by Professor Samuel Pierpont Langley under the patronage of the United States government. The regrettable controversy which has developed since Langley's death as to priority in the invention of the first man-carrying airplane capable of sustained flight has clouded the scientific integrity of the national scientific society, the Smithsonian Institution, and impelled Orville Wright to deposit the airplane which made the classic flight at Kill Devil Hill, North Carolina, December 17, 1903, not in the Smithsonian Institution, where it belongs, but in the Science Museum at South Kensington, London. This ten-year controversy has not only fully established, in my own mind and in that of scientists generally who are not associated with the Smithsonian Institution, the priority of the Wright brothers, as to first invention and first flight of a man-carrying, motor-driven airplane:

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it has established beyond any question the status of the Wright brothers as scientists of distinction as well as mechanics of a wizard-like inventive skill.

Propaganda, of a subtle and insidious type, has fostered a comparison between Professor Langley, as a distinguished scientist, and the Wright brothers as ingenious mechanics, to the great disadvantage of the latter. Langley is lauded for his experiments, his computations, his published tables and data, and in general for the authentic scientific study of the problem of flight. The intimation is dexterously conveyed to the general reader, by this literature of veiled propaganda, that the Wright brothers were not true scientists, but only clever bicycle-makers, with considerable mechanical skill, who by tireless perseverance and hit-or-miss methods were finally lucky enough to hit upon a solution of the classic problem which they did not scientifically understand.

The exact opposite to this deliberate distortion of scientific values regarding the Wright brothers, is actually the truth. While the Wright brothers never attended a college, uni-



*Copyright Cornwell, Dayton, Ohio*

*Erville Wright*



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versity or technical school, they came of a family of highly intelligent people, gifted with inventive talent; and secured the benefits of an excellent high-school education. Two older brothers, a sister, Katherine, and their mother had all attended college; and their father, with the benignant mien and brooding face of a patriarch, was a man of distinction, editor, teacher, and a bishop of the United Brethren Church. Orville and Wilbur, living in a mentally stimulating atmosphere, and surrounded by books, developed habits of quiet reflection and patient inquiry which, coupled with the bent toward mechanics, constituted the basis of their scientific temperament. The detailed story of their invention of the airplane conclusively demonstrates that, as bicycle-makers, their great scientific gifts were wasted; and that they only needed the stimulus of the airplane mystery to bring to the surface the extraordinary mental faculties which found full expression in scientific research, elaborate experimentation, ingenious and constantly renewed invention, and finally the supreme organizing and integrating power which brings imaginative concepts to tangible realization.

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When Wilbur was eleven and Orville four, their father brought home one day a surprise package. "Before we could see what it was," they have related, "he tossed it into the air. Instead of falling to the floor, as we expected, it flew across the room, till it struck the ceiling, where it fluttered awhile, and finally sank to the floor. It was a little toy, known to scientists as a 'hélicoptère,' but which we, with sublime disregard for science, at once dubbed a 'bat.' . . . A toy so delicate lasted only a short time in the hands of small boys, but its influence was abiding." The incident, familiar in the lives of thousands of other children, takes on deep significance in the lives of these two men. For during the next eighteen years, they read widely in scientific literature and pondered deeply various mechanical problems. They made various helicopters of their own, as boys, and became widely known among their fellows as experts in kite-flying. They lived on into an era of intense activity among inventors who were seeking the solution of mechanical flight. During the 'eighties, the German mechanical engineer, Otto Lilienthal, studied the flight of birds; and from 1891 until

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1896, when he was killed in a fall of one of his gliders, made more than two thousand flights. The Englishman, Percy S. Pilcher, suffered a like fate in making a similar experiment. The most scientific studies of all were made in the late 'eighties by Professor S. P. Langley, who published the results of his discoveries on air-support of flying planes in 1891. In 1896 he demonstrated the fallacy of Sir Isaac Newton's mathematical "proof" that a mechanical flying-machine was impossible, by inventing a steam airplane which flew three-quarters of a mile down the Potomac River. The principles for the scientific construction of gliding machines, worked out by Octave Chanute of Chicago, were demonstrated by him in experiments on the shores of Lake Michigan in 1896. In this same year, the Wright brothers who, until then, had given only a passing attention to the subject of flying, actively directed themselves to study of the subject as the result of the sad death of the brilliant Lilienthal. "We then studied with great interest," they have related, "Chanute's 'Progress in Flying Machines,' Langley's 'Experiments in Aerodynamics,' the 'Aeronautical Annuals' of

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1895, 1896, and 1897 [not of 1905, 1906, and 1907, as erroneously stated in the *Century Magazine*], and several pamphlets published by the Smithsonian Institution, especially articles by Lilienthal and extracts from Mouillard's 'Empire of the Air.' ” They spent four years in the study of the subject, simply as a scientific pastime, and confined themselves to laboratory experiments. Already, almost incredible progress toward the solution of mechanical flight had been made by other scientists and inventors; and numerous machines had already flown successfully in still air. The problem to be attacked—one of supreme difficulty—was the problem of equilibrium. Ever since the days of Leonardo da Vinci, who made elaborate studies of the flight of birds and left diagrams for flying-machines, inventors had been trying to discover how to control an air-supported machine so that it would not capsize under the influence of the wind. Fascinated by their own laboratory experiments and inspired by the delightful descriptions of Lilienthal, Mouillard and Chanute, they determined to carry on a series of experiments in soaring flight. In 1900, in a spirit of sportsmanship,

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they began their experiments in gliding—preferring this to hunting, fishing, golfing and other forms of sport. In the incredibly short space of three years, they solved the problem which had baffled the ingenuity of scientists and inventors for centuries.

The Wright brothers first took up aeronautics merely as a sport. They had no thought of embarking upon any general scientific experiments. The further they went with their experiments, the more fascinated they became; and it was only with reluctance that they finally devoted their combined brain-power, exercised as a thinking unit, to the many problems which confronted them. They were not initially interested in the experiments of Hudson Maxim, who had abandoned his attempts at power flight; and their interest in Langley's extremely important and scientifically valuable experiments was not on account of power flight but because of his published measurements on air pressure against plane surfaces. After rejecting the results of Langley and his predecessors, because of discrepancies and discordances, they entered in the true scientific spirit upon a series of systematic

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measurements of air pressure upon various surfaces, derived from two ingenious machines of their own construction.

After studying minutely the work of their predecessors, they showed profound insight in the respective choice and rejection of features of former types of gliders. They adopted the double-decker or biplane principle, approved by both Lilienthal and Chanute; but rejected their principle of the operator's body-shifting in favor of a new method of their own devising, regulating the movement of the centre of pressure by shifting the rudder and the planes of their machine. The result of their first experiments with gliding at Kitty Hawk was encouraging, since it demonstrated the correctness of their new and revolutionary method of steering and balancing. In 1901, with the encouragement of Octave Chanute, whom they met that summer, they made many experiments in gliding at Kitty Hawk. The experiments in coasting downhill on the air, during which they travelled as far as three hundred feet in a twenty-seven mile gale, were not encouraging—although Chanute, who witnessed the flights, assured them that there was no fault

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in the construction of their machine. It was as a result of these experiences that they carried out the scientific experiments on air pressure already mentioned. The experiments at Kitty Hawk in 1902, made with a new glider on advanced lines, were much more successful—the longest flight being one of six hundred and twenty-two feet. So delighted was their assistant this year—not Chanute, but only a physical helper wholly unversed in science—that he enthusiastically declared: “All that machine needs to make it stay up there indefinitely is a coat of feathers to make it light!”

All their investigations, experiments and flights were carefully analyzed; and thus they were led to make many changes in their tables of calculation for aerial pressure. Many new principles were established. The essential problems of gliding were solved, for a properly constructed machine carrying an operator, which would be sustained in flight through the air at the rate of eighteen miles per hour. The period of gliding experiments was over. The time and occasion were ripe for the construction of a power-driven machine. After months of investi-

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gation, they designed a propeller which in all respects met the particular conditions of their machine. After a succession of disheartening mishaps, occurring throughout the entire autumn of 1903, a flight was attempted by Wilbur on December 14, which lasted only three and a half seconds and ended in a crash. Another flight was attempted on December 17, with the repaired plane, which had suffered damage in the previous unsuccessful attempt at flight. "Wilbur, having used his turn in the unsuccessful attempt on the 14th," says Orville, "the right to the first trial now belonged to me. . . . A sudden dart when a little over 120 feet from the point at which it rose into the air, ended the flight. . . . The length of the flight was equivalent to a flight of 540 feet made in calm air. This flight lasted only 12 seconds, but it was nevertheless the first in the history of the world in which a machine carrying a man had raised itself by its own power into the air in full flight, had sailed forward without reduction of speed, and had finally landed at a point as high as that from which it started."

The world remained incredulous of the actual achievement. For several years the Wrights

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continued, quietly, to perfect their machine and to acquire facility in flight. Few people went to observe their flights, near Dayton. It was not until Orville made his great flights in this country, Wilbur in France, that the whole world awoke to the magic and wonder of the achievement. So phenomenally rapid has been the development of the airplane, since the Wrights invented their machine, that it has become a mighty industry and the most thrilling of contemporary sports. The press is daily filled with acclaim for some new flyer—Lindbergh, Byrd, Wilkins—or some record-breaking flight, over continents and across oceans. The world owes this wonderful development primarily to the inventive genius of the Wright brothers. Their place in the history of invention, the conquest of the air, and the great new industry of air-transportation is as assured and unassailable as that of Archimedes, Da Vinci, Gutenberg, Galileo, Morse, Bell, Edison and Marconi. A blot will rest upon the American escutcheon so long as the officials of the Smithsonian Institution continue to placard the Langley aerodrome with false and misleading labels. Justice will never be done un-

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til the original Wright biplane of 1903, without any undertaking whatever on the part of Orville Wright as to his acknowledgment of the good faith of the Smithsonian Institution, be placed in the national museum of science at Washington and officially labeled: "The first heavier-than-air craft in the history of the world to accomplish sustained free flight under its own power, carrying a man."

## IGNACE JAN PADEREWSKI

### MUSICAL GENIUS AND GREAT LIBERATOR

A GREAT concert hall, thronged to the ceiling. Upon an empty stage the outlines of a grand piano are faintly visible; the lights are dimmed. Behind the instrument, the black velvet curtains part, and a strange and majestic figure appears. The splendid torso, the leonine head with its tawny aureole, the regal air and bearing might belong to a king and emperor; the eyes are the eyes of a poet. The frenzy of applause dies to a breathless hush; the world stops; space and time cease to exist, and the universe of music is the only reality.

The scene changes. Warsaw, on the Vistula, is athrob with mad excitement. The sun strikes fire from towering spires and golden domes; and throws into high relief the statue of Copernicus. The streets—the Jerusalamer Allee, the Nowy Swiat—are thronged with people—awaiting the coming of the liberator. A genius who has sacrificed his art, abandoned his career, surrendered

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his fortune, struggled with the mighty at Paris, wrought for them the miracle of liberty—is at hand. A people of glorious history, who have suffered the martyrdom of alien domination for a century and a half, are wild with joy. A mighty figure appears in the doorway—and pandemonium breaks. “Paderewski! Vivat Paderewski!” Men fling hats into the air, women rush forward to kneel and kiss the hem of the liberator’s garment. Poland is free!

From peasant to premier is a mighty stride. Yet the pages of history are rich in romances of the rise from the ranks of the humble to the seats of the mighty. Ambition surmounts all obstacles; there are no bars to greatness. But Paderewski has written a new page in world-history. It is not the romance of successful ambition, not the attainment of the goal of a lifetime’s striving. Paderewski’s romance is a tale the world has not heard before. The great musician, standing in middle age at the summit of his art, undergoes a transformation so revolutionary as to baffle a world’s credulity. It is Chopin transformed into Kosciusko, Verdi turned Garibaldi. The pianist is swallowed up

in the patriot; and music yields place to statesmanship. Paderewski plays a masterpiece in the concert of the powers. The name of this new-century Marseillaise, this triumphant neopolonaise, is Poland.

When the revolver-shot of Gavril Prinzip sounded the summons to World War, Paderewski had been for almost a quarter of a century the idol of musical salons, the lion of the concert halls. The world of men acknowledged his supremacy as pianist; the world of women fluttered ecstatically about a golden aureole, hirsute and heraldic. The moving story of the rise to world-fame of this son of a Polish farmer, banished to Siberia for muttered protests against Russian tyranny, was known to all. In 1877, the lad of seventeen fared forth upon a concert tour which seemed to spell irretrievable failure. Neither money nor fame crowned the early efforts of the young musician, handicapped with "stubby fingers" and innocent of apprenticeship to any great teacher of music. Ingenuity in improvisation could not supply the place of technic; and musical feeling was no substitute for masterly execution. "He who can, does; he who cannot,

teaches," says Bernard Shaw. At the age of eighteen, then, Paderewski secured an appointment as professor of music at the Conservatory in Warsaw. Paderewski once said, in a revealing passage: "Any one who takes up piano-playing with a view to becoming a professional pianist has taken on himself an awful burden. But better that than the drudgery of giving pianoforte lessons. The one is only purgatory, but the other—hell!" For five years he suffered torments of starved aspiration and thwarted ambition; taught when he should have been studying; married, only to lose his wife within a year. Finally in despair, the pedagogue turned pupil; studied madly for two years under the great Leschetizky in Vienna, practising eighteen hours a day, and at last achieved complete mastery of the pianoforte. With that assurance which comes only from consciousness of power, Paderewski now set his feet in the path to fame and fortune.

Triumph succeeded triumph. The capitals of the world—Vienna, Berlin, Paris, London, New York—resounded with his praises. No pianist since the days of Liszt has created such popular furore or won such personal triumphs in univer-

sal acclaim. Paderewski's supremacy was undeniable and virtually unchallenged. To his virtuosity as an executant, his mastery of rhythm and tone, was added a second renown as a composer. In the musician, unsuspected by the world and perhaps unknown to Paderewski himself, was concealed an orator of passion and power. The Paderewski of these post-war days has forsaken the realm of dream, that crepuscular region of shadow, where once his brooding spirit dwelt. The leader, the orator, the premier thunders forth but recently with dynamic force and masterful authority.

Paderewski, the great musician, of the period from 1891 to 1914, was unsurpassed in poetic rendition and individual tone. "Mysteriously, but full of light from a great distance," says Arthur Symons, came this strange music, this strange musician. "He startles music into a surprised awakening. He seems to play out of a dream." In Paderewski rules a double genius—at once creative and interpretive. A symphony, a concerto, piano pieces, songs, fruits of his creative genius, have been ranked among the best written by his contemporaries. His

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opera "Manru," has been pronounced by Henry T. Finck as "the most inspired dramatic work since 'Carmen' except 'Parsifal'." As a pianist he is destined to rank in musical history with Liszt and Rubenstein. As a musician, composer, and creative artist combined it would be difficult to find a parallel.

There is a quality in Paderewski, the artist and the man, which evades fixed definition. There is a royal glow, a noble ardor of temperament which is merely symbolized in the leonine torso, the golden aureole. He is a knightly champion of music, and this chivalric note of heroic gallantry must inevitably fire an audience to flame. Deeply revelative are his words: "If I were asked to name the chief qualification of a great pianist, apart from technical excellence, I should answer in a word, genius. That is the voice which all men will stop to hear! . . . Referring to the celebrated 'paradox' of Diderot, I am firmly of the belief that the pianist, in order to produce the finest and most delicate effects, must feel what he is playing, identify himself absolutely with his work, be in sympathy with the composition in its entirety as well as with its every shade of ex-



*J. J. Radzewski*

FROM AN ETCHING BY EMIL FUCHS



## IGNACE JAN PADEREWSKI

pression. . . . Yet—and here is a paradox indeed—he must put his own personality resolutely, triumphantly into his interpretation of the composer's ideas.”

Paderewski is a man of amazing versatility, a composite of extraordinary talents which his reputation solely as a great musician long sufficed to obscure. In hours I recently spent as his guest, I was impressed, arrestingly, with the incisive vigor and sharp individuality of his opinions, on music and musicians; on great figures in the world of art and letters, of politics and affairs. Of Wilson he spoke in terms of warmest personal regard and the highest admiration; and yet he did not hesitate to point out several actions in which he considered Wilson gravely at fault. Concerning Poland and its future he was reticent; and yet his mind at the moment was deeply occupied with orations soon to be delivered to great Polish societies in New York and the Middle West. It is no legend but a fact that he has the photographic eye and mind: documents carefully read through once are his forever, speeches committed to paper become integral to his thought and are uttered without the

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assistance of notes. Charming, gracious, easy as a host, Paderewski takes a boyish delight in amusing stories, witty epigrams; and once the strain of a concert is past, relaxes in a mood of happy gaiety. True artist, temperamental, oscillating from gay to grave, he naturally reverts to his habitual mien of stately dignity; and when a concert is imminent is the lion indeed, fearsome and unapproachable. For music he entertains the loftiest ideal as an autonomous art, unique in creative force and individual expression. "Music," he says somewhere, "is not a handmaid, a slave; it should not be made subordinate to poetry, a mere decoration; it should have its own form, its own meaning, its own *raison d'être*."

When the World War came, Paderewski was a being transformed. His insight was unerring, his political acumen infallible. For a Poland divided three ways—between Austria, Germany, and Russia—freedom seemed to many utterly chimerical and fantastic, the baseless fabric of a dream. Paderewski divined with an astuteness amounting to political genius the only clear chance for freedom offered in his lifetime. In the victory of the Allies lay the opportunity for

Poland to become once again an autonomous state. The millions of Poles living outside distracted Poland, obsessed with the delusion of an ultimate victory of the Central Empires, must be welded together into a formidable body, cohesive in thought and action for the cause of the Allies. Paderewski closed his piano and for five years it remained unopened. The Podolian commoner who had subjugated the world as musician now flung himself with unrestrained ardor and strenuous energy into the colossal task of world-organization of his fellow-countrymen. Letters, ciphers, secret emissaries were despatched by Paderewski from his estate, Morges, near Vevey on Lake Geneva in Switzerland. By January, 1915, he had launched the "General Polish Relief Committee" from Switzerland; organized a second branch in Paris, a third in London. Next he sailed for the United States in April, 1915; and, by his magical influence, inspired a passion of enthusiasm among the Poles in America. The volatile, temperamental artist had become the dominant and aggressive leader of a militant Poland. Although Washington declined his offer of a Polish corps, two hundred

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and twenty thousand Poles were called to military service under the Stars and Stripes. The division of thirty thousand Poles, which Paderewski organized, was offered to France and was accepted by President Poincaré. On July 14, 1918, these Polish troops went into action near Chateau Thierry under the French General Arcinard, and covered themselves with glory in aiding to check the German advance.

During these stirring days, Paderewski placed himself unreservedly at the service of the American government. Through his wide knowledge of conditions, the volume of authentic information regarding Poland and conditions in central and eastern Europe which he had amassed by means of numerous secret emissaries, he proved of invaluable service to this country. It was through his intimate association with Colonel House and contact with President Wilson that the liberation of Poland came to be recognized as one of the war-aims of the Allies. One of the famous "Fourteen Points" enunciated by President Wilson on January 8, 1918, was Point XIII:

"An independent Polish state should be erected

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which should include the territories inhabited by indisputably Polish populations, which should be assured a free and secure access to the sea, and whose political and economic independence and territorial integrity should be guaranteed by international covenant."

With masterly skill and diplomatic finesse, Paderewski utilized the opportunity afforded by Wilson's pronouncement. Poland was caught fast in the iron grip of German occupation, and thirty thousand Poles who refused to obey the orders of Governor General Baeseler to fight for Germany, were ruthlessly hanged. But Paderewski organized "The Polish National Committee of Paris" which voiced the national aspirations of Poland and presented her desires to the Allies. Following the armistice, Pilsudski formed a government in Poland and established himself as dictator. Pilsudski's government, composed almost exclusively of Socialists, was not representative of the people; and Paderewski proposed to Pilsudski the establishment of a coalition cabinet. With the aid of the British government, he proceeded to Poland via Danzig. He was in extreme peril; at Posen, a city held by

Germany, the windows of his hotel room were shot out by machine guns. "I begged Paderewski," says Ivonowski, "to come out of the room at once. Instead he sat on the edge of the bed and began to pull on his clothes, paying small heed to the whizzing spray of steel that dug into the walls only a little above his head, and none at all to my frantic appeals. . . . With bullets pouring past to right and left, he stood there before the mirror and tied his tie!" His courage had its reward in an enthusiastic welcome by the inhabitants of this predominantly Polish city; and as the result of his inspiring presence the province of Posen within a week was in Polish control. A hundred thousand madly excited Poles greeted Paderewski at Warsaw; and Cracow, the ancient capital, received him with open arms.

Negotiations between Paderewski and Pilsudski in behalf of a coalition government and a reunited Poland were greatly aided by the presence in Warsaw of the American Food Mission. In a great speech, at this crucial period—which Vernon Kellogg calls "one of the most eloquent and effective speeches I have ever heard"—

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Paderewski called on the people of Poland to hold closely together, to work for the common good, and to abjure violence in their efforts to secure a truly representative government. It was a speech which breathed the purest patriotism and reveals Paderewski in all his greatness. A coalition was formed, representative of the three divisions of Poland; and Paderewski was chosen Prime Minister with authority to proceed to Paris to act as spokesman for his government. We must forget Paderewski as a great piano player, says a distinguished American, and remember him as a statesman, an orator and a patriot.

The masterly diplomacy and statesmanlike vision, displayed by Paderewski at the Peace Conference, are pledges of lasting fame. In the fiery furnace of the Conference, says House, few survived the cruel and relentless flames. "Of those few I should place Paderewski first. He came to Paris in the minds of many as an incongruous figure, whose place was on the concert stage, and not as one to be reckoned with in the settlement of a torn and distracted world. He left Paris, in the minds of his colleagues, a states-

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man, an incomparable orator, a linguist, and one who had the history of his Europe better in hand than any of his brilliant associates. Had he been representing a power of the first class he easily would have become one of the foremost of those whose decisions were finally to be written into the Peace. As it was, he played a great part nobly, and gave to the world an example of patriotism, of courage, of which it is always in need." History will write the chapter concerning his rule as first Prime Minister of the free Poland of today. Even now, we divine in Paderewski a genius of extreme versatility, for whose parallel in varied eminence we must seek among the myriad-minded colossi of the Renaissance. The late Robert Lansing paid this superlative tribute to Paderewski: "The beauty of his character, the finesse of his sentiments, the loftiness of his ideals, and the sensitiveness and modesty of his nature, constitute the highest impulses that control human conduct."

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### WOMAN AS SCIENTIFIC GENIUS

WE live today in the midst of a Great Awakening, that "awakening from dogmatic slumber" of which Immanuel Kant once spoke. Under the magic touch of wizard hands, the hands of Einstein, the Curies, Planck, Bohr, Michelson and Millikan, the leaden lids of a slumbering civilization are lifted, for eyes to view the cosmos with startled interest and sharpened vision.

The miracles of contemporary science herald and summon a "renaissance of wonder" of which Watts-Dunton little dreamed. The miracles of Scripture were miracles of sense—of sight and sound and touch. They were the outward and visible sign of an inward and spiritual grace. The Word must be made flesh and dwell among us before it might be accepted as Truth. The miracles of modern science are miracles of the invisible, the intangible, I had almost said the occult. Science asks as great a feat of the spirit

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as religion has ever dared to ask. *Credo quia impossibile* might almost be the motto of the science of today. We are asked to accept the existence of forces unseen, the imponderable and unproven. No one has ever seen an electron; an Angstroem unit is far too minute for measurement by a scale held in the hand; computation tells us that radium crystals emit tiny explosions at the rate of three hundred and sixty thousand per second; the enormous gravitational force of the companion of Sirius is fortunately beyond our ken.

In this era when Science writes romances beside which Art pales its ineffectual fires, a supreme credulity is the first requirement of its aptest votaries. The science of the past was grounded upon the demonstrable evidence of the senses. The science of the present is realizing the anticipations of Jules Verne, the premonitions of H. G. Wells, the fantasies of *Alice in Wonderland* and *Through the Looking Glass*. The imaginative scientist of today imposes as his first condition the voluntary abdication of "common sense." Bernard Shaw wittily remarks: "The medieval doctors of divinity who did not

pretend to settle how many angels could dance on the point of a needle cut a very poor figure as far as romantic credulity is concerned beside the modern physicists who have settled to the billionth of a millimetre every movement and position in the dance of the electrons. . . . Why the men who believed in electrons should regard themselves as less credulous than the men who believed in angels is not apparent to me. . . . In the Middle Ages people believed that the earth was flat, for which they had at least the evidence of their senses; we believe it to be round, not because as many as one per cent of us could give the physical reasons for so quaint a belief, but because modern science has convinced us that nothing that is obvious is true, and that everything that is magical, improbable, extraordinary, gigantic, microscopic, heartless or outrageous is scientific."

↳ Madame Curie is indisputably, I think, not only the greatest living woman scientist, but the greatest woman scientist who has ever lived. Her life has been one of impassioned consecration to the cause of pure science. The epochal discoveries she has made illustrate with the utmost

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force and conspicuousness the necessity for creative work in pure science irrespective of any immediately practical aim in view. On a memorable occasion, Simon Newcombe gave this famous toast: "Here's to Mathematics; may it never be of use to anybody!" After reading a highly theoretical paper on the theory of numbers to a scientific body, the English mathematician, H. J. S. Smith, blandly remarked: "It is the peculiar beauty of this method, gentlemen, and one which endears it to the really scientific mind, that under no circumstances can it ever be of the smallest possible utility!" The worker in pure science follows the truth whithersoever it may lead, never knowing whether the results of the researches will have any practical applications, in the arts, in industry, in agriculture, in therapeutics, in any of the so-called "affairs of real life." Never was there a more theoretical subject than that of the Absolute Differential Calculus propounded but a few years ago by the Italian mathematicians, Ricci and Levi-Civita. And yet, when Einstein needed the most delicate mathematical machinery for the erection of the towering structure of Relativity, he found it,

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miraculously enough, in the purely theoretical and "entirely useless" contributions of Ricci and Levi-Civita.

So it was with Madame Curie. When she began her researches in radio-activity, she little dreamed of the incalculable therapeutic consequences to follow her discoveries in the domain, not of physic, but of physics. In the first address she delivered in this country on her visit in 1921, at Vassar, Madame Curie used these quietly impressive words: "We must not forget that when radium was discovered no one knew that it would prove useful in hospitals. The work was one of pure science. And this is a proof that scientific work must not be considered from the point of view of its direct usefulness. It must be done for itself, for the beauty of science, and then there is always the chance that a scientific discovery may become, like radium, a benefit for humanity."

In view of the extremely rapid progress made in its study, it is difficult to realize that radio-activity was discovered by Henri Becquerel so recently as 1896; and that the most famous element in the universe, radium, was discovered

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two years later, the announcement of its discovery being made in December, 1898. Many other radio-active substances have since been discovered and exhaustively studied. Radio-active substances when excited emit three kinds of rays—known respectively as alpha, beta and gamma rays. The alpha particles travel sometimes as far as 11.3 centimeters, and have velocities from one-twentieth up to about one-tenth the velocity of light, the highest known velocity. The beta particles have exceedingly high velocities, ranging to as high as 0.998 times the velocity of light, which would be about 186,000 miles per second. The gamma rays, the most penetrating of all, are propagated to a great distance through the air, go readily through the human body, and can pierce matter as dense as lead or iron an inch or more thick. In an article, "The New World of the Atom," I describe an instrument devised by Madame Curie which was exhibited at the Physical Exhibition in Paris several years ago. As each alpha particle from a fragment of polonium penetrates a tube, there is a luminous discharge which acts as a switch, throwing into circuit a minute electric current that actu-

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ates the loud speaker of an ordinary wireless valve receiver; and a loud tick-tick thus announces the discrete disintegration of polonium. The announcement of the discovery of this element was made by the Curies in July, 1898; and it was given the name *polonium* by Madame Curie, in memory of her native country of Poland.

During the greatest period of her activity as a discoverer, Madame Curie worked in close collaboration with her husband, Pierre Curie, who was equally gifted as a scientific investigator. Together they are associated, not only with great discoveries in science, but also with the loftiest ideals regarding science and discovery. Both tenaciously championed pure speculation and disinterested research, so often leading to fruitful discoveries which later prove useful in unforeseen directions. Both devoted themselves to science with the utmost fervor and an almost monastic consecration, abjuring "the world," the vapid blandishments of society, the blare of publicity in favor of the universal aims of research. In temperamental union and intellectual identity, they dedicated their discoveries to the world,

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and with an almost quixotic selflessness, declined to take out any patents or reserve to themselves any financial advantage through industrial exploitation. In obedience to this lofty and unworldly ideal, they cheerfully sacrificed a fortune. This memorable exhibition of generosity, prompted by the desire to serve humanity, will endure as a classic example of the highest ideal of scientists.

Marie Sklodowska, who was born of Polish parents in Warsaw on November 7, 1867, has undeviatingly pursued scientific work of the highest type from her early years. After taking a broad course of study in the "lyceum," she turned definitely to mathematics and physics, inheriting the tastes and talents of her father, who was Professor of Physics and Mathematics in one of the lyceums of Warsaw. After serving as governess in Polish families for several years, and doing much independent reading, she finally went to Paris in November, 1891, to continue her scientific studies. During this heroic period of hardship and intensive study, she found delight in the world of science which now opened to her; and in these four years won first rank in

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physics and second rank in mathematics. "For myself," she once remarked, "I shall always consider one of the best memories of my life that period of solitary years exclusively devoted to the studies, finally within my reach, for which I had waited so long."

At their first meeting, in 1894, Marie Skłodowska and Pierre Curie, a young French physicist, found a sympathy of common interest which led to the formation of a permanent life-partnership. The next year they were married, and began together a life of happy association and scientific collaboration unique in this or any age. With scanty means, inadequate equipment, and laboratories so bare and inappropriate as scarcely to deserve the name, they carried out together the remarkable researches, characterized by rare patience, undivided devotion, and refined skill, which eventuated in some of the greatest and most socially beneficent scientific discoveries of the age. They passed through a period of fascinated interest, in seeking to isolate the radioactive substance which they believed to constitute a new element. "One of our joys," says Madame Curie in the biography of her husband,

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“was to go into our workroom at night; we then perceived on all sides the feebly luminous silhouettes of the bottles or capsules containing our products. It was really a lovely sight and one always new to us. The glowing tubes looked like faint, fairy lights.” Surely the Curies were following the Gleam.

On April 19, 1906, Pierre was struck and killed by a truck as he was crossing the rue Dauphine. His death was a terrible blow to his wife, who loved and admired him in an incomparable degree. Only a year and a half before his death, Pierre Curie had had bestowed upon him the unparalleled honor of election by the Faculty of Sciences of Paris to a chair in the Sorbonne. This honor now came to her; and with diffidence she accepted it. Until that time, no woman had held such a position. Already in 1903 the Nobel Prize had been awarded jointly to Becquerel, Pierre and Marie Curie for the discovery of radio-activity and new radioactive elements. A measure of the distinction of her work after her husband's death is afforded in the award of the Nobel Prize in 1911 to Madame Curie for her individual work. The first experi-

ments on the biological properties of radium were successfully made in France during Pierre Curie's lifetime with samples from the Curie laboratory. The amazingly rapid development of the new branch of medical science of radiotherapy, which is known in France as *Curie-therapy*, and of the radium-producing industry is one of the marvels of the age. The exceedingly minute quantity of radium, in proportion to the amount of ore used in its reduction, is shown when it is realized that when radium was commercially produced in this country some years ago it took four hundred and fifty tons of the carnotite ore found in Paradox Valley, Colorado, to yield about two and a quarter grams of radium—scarcely a teaspoonful. The value of radium was then estimated to be two hundred thousand times its weight in gold; and yet, because of its curative and beneficial effects in the treatment of diseased tissue and especially of cancer, it was cheap at the price. The comparatively recent discovery of rich deposits of radioactive ores in the Belgian Congo has reduced the price of radium some forty to fifty per cent. Radium institutes, which now exist in some of

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the great world-centers, are accomplishing marvels in behalf of suffering humanity. The debt of the human race to Pierre and Marie Curie can never be paid.

Beyond all other countries, the United States has shown its appreciation of the great work of the Curies. It is America's great scientist, Millikan, who has accurately measured the electron. In 1907, the late Andrew Carnegie donated to Madame Curie's laboratory an annual income for research fellowships. In 1921, Madame Curie came to this country to receive a gram of radium, estimated to be worth about one hundred and twenty thousand dollars, the gift of the women of America. This fund was raised through the efforts of Mrs. William Brown Meloney, who conceived the beautiful idea of such a testimonial of admiration. Before Madame Curie accepted that gift in the White House on May 20, 1921, she requested Mrs. Meloney to have a lawyer draw up a deed bequeathing the ownership of the American radium to the Institute Curie in Paris to be used in perpetuity for scientific research. During that year many of the great universities and scientific

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societies of this country conferred their honorary degrees, medals, and other awards upon Madame Curie. Only recently Madame Curie again visited this country, to receive from the hands of President Hoover at the White House on October 30, 1929, a gift of \$50,000, to purchase a second gram of radium, for use in the Warsaw Hospital. This fund was likewise raised by Mrs. Meloney and other American admirers of Madame Curie, when they learned that there was no radium in Poland and that this selfless scientific spirit was planning to divert the small income given her by some American friends to rent radium for use at the hospital and institute at Warsaw.

It is such recognition as these princely gifts of the women of America that Madame Curie has long deserved. The great radium institutes and radium-producing companies, which have profited so handsomely through the Curies' gift of their discoveries to the service of humanity might well endow the Curie Institute of Paris in token of gratitude. "Humanity, surely," says Madame Curie, "needs practical men who make the best of their work for the sake of their own in-

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terests, without forgetting the general interest. But it also needs dreamers, for whom the unselfish following of a purpose is so imperative that it becomes impossible for them to devote much attention to their own material benefit. No doubt it could be said that these idealists do not deserve riches since they do not have the desire for them. It seems, however, that a society well organized ought to assure to these workers the means for efficient labor, in a life from which material care is excluded so that this life may be freely devoted to the service of scientific research."

## HENRY FORD

### THE GENIUS IN BUSINESS

FOR a number of years Henry Ford has been the most discussed man in the world. He is often credited with being the richest man in the world. The shop-windows of bookstalls in England and all over Europe, when I was last abroad, teemed with copies of books by and about him. Whether unconsciously or by design, he holds in his hands the threads of international publicity. Thousands upon thousands of public garages display his fine, ascetic face, trembling upon a whimsical smile—the straight-forward look, the keen yet visionary eyes. Millions upon millions of motor-driven vehicles carry his name into remote fastnesses, through crowded thoroughfares, desert or jungle, to the uttermost parts of the earth. Persons innumerable who have never seen him and will never be within a thousand miles of him, speak of him with jovial camaraderie, utter his name with chuckling familiarity, and tell the latest “Ford joke” which

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always has the "point" in favor of his extraordinarily efficient and pushful "Tin Lizzie"—all because they are the lucky and comical possessors of a "Ford"!

This is a phenomenon of almost unprecedented character. Seldom do millions of people speak in such terms of jocular familiarity of anyone save a favorite politician—an Andy Jackson, an Abe Lincoln, or a Teddy Roosevelt. And while it is true that Ford has reluctantly played his rôle in politics as an unsuccessful candidate for the United States Senate and as an oft-mentioned Presidential possibility, the political aspect of his career can hardly be said to account for his amazing reputation, the smiling affection with which his name is almost universally spoken by the man-in-the-street, the deep-seated sense of loyalty which he so obviously invokes. The reason for these public expressions and demonstrations goes very deep—to the very nature and soul of the man himself.

This phenomenon of the vigorous championship of Ford on the part of Mr. Average Citizen, Mr. Farmer, Monsieur Tout Le Monde, as Voltaire put it, is all the more singular, in view of

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the generally acknowledged fact that Ford is an enigma. Penetrating foreign observers, recognizing that America's chief repute rests upon her colossal achievements in business and engineering, in finance and invention, are astonished to discover how little we really know or understand the personality and character of our great bankers and captains of industry, our inventors and engineers—Rockefeller, Morgan, Schwab, Ford, Edison, Roebling, Eads. Gallons of ink are spilled in narrating their achievements, estimating their wealth, or detailing the minutiae of their structures or inventions. But the secrets of personality and temperament, of character, disposition and soul, are lightly passed over as subjects too immaterial for analysis, investigation and conclusion. Ford's singularly enigmatical character conspicuously illustrates this generalization. His books—*My Life and Work* and *To-day and To-morrow*, each written in collaboration with Samuel Crowther—are opaque, un-revelative, dry-as-dust. They relate, in a confused and disordered fashion, the evolution of the business and social principles and policies of the leader of a great industry. Of the man him-

self—his emotions, disposition, idiosyncrasies, prejudices, prepossessions, qualities, temperament, character—they reveal less than nothing. Indeed, these books seem to serve as a sort of industrial smoke-screen to hide from the public the heart and soul of a man.

Ford's secret remains undiscovered. None of his biographers has even made the attempt to unravel the web of Ford's mystery. There is nothing, apparently, in either his heredity or his environment to explain the inventor and the great business reformer. Born in Dearborn, Michigan, on July 30, 1863, of parents of British and Dutch descent, respectively—William Ford and Mary Litogot—Henry had a common school education, of which the foundation stones were Webster's "blue-back speller" and McGuffey's Readers. He liked to tinker with machinery, to take watches apart and put them together again; and from the outset showed a delicate hand, a comprehension of machinery, a knowledge of "how things worked."

The sight of an engine for driving threshing machines, moving along the road under its own power, enthralled the twelve-year-old boy. This

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miraculous spectacle stirred some echo of creative impulse in his slow-revolving mind. He has described the incident as "the biggest event of those early years." Young Henry kept tinkering with machinery, making things, taking engines apart to see how they worked. Without any formal training whatever in science, he learned by doing; labored in engineering plants and studied the mechanism of engines driven by steam and by gasoline. The idea of a four-wheeled, motor-driven vehicle seemed to obsess him; and the neighbors laughed as the sporadic, sputtering noises from his shed laboratory split the night air. This tall, thin young man, with the dreamy and speculative eye of the fanatic, must be crazy!

One night—of uncertainty and trepidation—the dream came true. Many others, with far more "scientific" knowledge, were working on the idea: Selden, Daimler, Butler, Duryea, Pierce. Ford was working alone, with comparatively little scientific knowledge derived from books, but a thorough practical understanding of the nature of the gas-engine. One night in 1893, under the eye of his wondering young wife,

he drove his strange little vehicle—a shackly, fragile carriage almost shaken to pieces by the violently sputtering motor—to the end of Bagley Avenue and back. The rest of the story is familiar to the world—the gradual improvements, the steadily growing popularity of the car on its conspicuous merits and efficiency, the sale of seventeen million “Fords,” the organization of the greatest and most immense laboratory in the world. But the mystery of Ford remains unsolved: perhaps he does not know it himself.

The masses champion Ford, admire him, laugh with him, watch him, applaud him—because they see in him a sort of champion of the masses. Ford, they say, is the only man who ever bucked Wall Street and won—and they believe it. Ford is not a typical American business man or capitalist: he runs counter to form. He has stood for the independence of industry, and against its domination by capital as represented in the banks. He believes in the autonomy of industry; and he has successfully defied, by astute and humanitarian policies, the bankers and the labor unions, respectively. He believes that great industries, in an era of standardization and mass



*Henry Ford*



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production, should be under industrial, that is immediate, control, as opposed to financial, that is outside, control. Liberated in great measure from the unpredictable fluctuations of capital, the handicaps of industrial depression, whether manufactured or real, the pressure of unscrupulous bankers ready to squeeze in a panic, autonomous and self-perpetuating industry can proceed unimpeded toward the achievement of its three-fold function: adequate profit for the employer, adequate wages and satisfactory living conditions of both work and leisure for the employe, and service to the public in the form of a highly efficient article at a genuinely moderate price.

The people admire Ford, from a sense of gratitude. By the people, I should indicate particularly the middle classes, the workmen, the farmers—the overwhelmingly rural class. The service he has performed by means of the Ford car is greater by far than the service performed by the telegraph, the telephone, rural free delivery, the phonograph, the radio, or by electric light and power. The Ford car accomplished more than any one of these, however great their

influence; for the most part these other conveniences and amusements served only to awaken visions of the great city, dreams of comfort, art, beauty, prosperity, and "the World." The Ford car enabled the farm dweller to realize in a measure the dreams which these other allurements evoked. It was the Magic Carpet which transported the ruralist to the place where he would be. Nothing in history has been so magically transforming in redeeming the unmitigated dullness and squalid monotony of rural life as the Ford car. The people, the workers, the agriculturists, the mechanics, the ruralists, see in Ford a sort of Messiah who came to redeem them—for a mere bagatelle—from the ruthless and un-pitying bondage of the soil. Today, with the appearance of other cars, efficient and almost as cheap as the Ford, the original sense of obligation to Ford may tend of necessity to wane and in time to disappear altogether. But I doubt if this feeling of indebtedness to Ford will cease during his own lifetime.

The "real" Henry Ford? Has anyone penetrated the mask of his imperturbability? Can anyone be said to "know" him? Einstein has

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shown, in the physical domain, that "truth" is relative to the observer. The records all differ: but no one is "truer" than any other one. So it is in the domain of the spirit. The Ford we know is the Ford Motor Company: that is Henry Ford. In the immense organization of industry and invention, the contemporary *entrepreneur* coalesces with his business. Men like Ford, Gary, Baker, Westinghouse, Edison are literally devoured, absorbed, by the colossal enterprises which they create, direct, and govern. In a former era, the Grand Monarque could say with a grandiloquent gesture: "*L'état: c'est moi.*" Today, with a simple wave of his hand, Henry Ford might truthfully say: "The Ford Motor Company: that's me."

Behind all that mechanical front—of wheels and cogs, belts and pinions, lathes and axles—is something more than a chimera, an enigma of business genius. Ford is a great man—not because he is representative of American big business, but because he is not representative of American big business. He has achieved his almost unbelievably huge fortune and kept it a going concern by sheer force of individual brain-

power, unshakable will, and continuous faith in himself. Over and over again, he has overridden the most urgent advice of his closest and shrewdest advisers, defied the threats of those who have sought to control or crush him, following the promptings of some secret and interior wisdom, some familiar genius, which guided him aright. Surely this is genius of a high order, to which the world as yet has found no clue.

For, judged by rigorous standards of culture, Henry Ford is undoubtedly an ignorant man, with little knowledge or understanding of the great reaches of the human spirit—of art, literature, music, philosophy. Imagine the answers of his mind to a searching questionnaire prepared by some great Harvard scholar, intended to evoke the cultural reactions of a highly educated man of today! Benedict Arnold would turn up as a popular English novelist, Descartes as a sunshine vehicle, Kant as an expression for impotence, Wagner as a famous baseball player. But give Ford a questionnaire prepared by Edison, filled with questions about engines, machinery, mineral deposits, industrial centers, chemistry, the incidence of taxation and the balance

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of trade, and Ford would make a grade A1. With a limited horizon of knowledge, a contracted cultural outlook, a mind amazingly prejudiced on some subjects and wholly closed on others, Ford nevertheless has immense powers of concentration, mental faculties trained for deep reflection, and a magistral self-confidence which has an air of the sublime. The attacks upon the Jews, projected in a long campaign through the columns of the *Dearborn Independent*, astounded the world by their unexampled prejudice and bitterness. Convinced of his error and the injustice of his accusations, Ford made an apology so generous and a retraction so sweeping as to disarm opposition and excite universal admiration for such gracious and boyish *naïveté*. When the single-track mind changes direction, it takes a course one hundred and eighty degrees removed from its original course.

Ford's most widely known and frequently quoted saying, "History is bunk!" has evoked a million japes, wise-cracks and sneers. The best and last laugh lies with Ford. History of the classic type *is* bunk, according to many contemporary historians: its stress falls at the wrong

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point; its drawing lacks perspective; the celebrities and spectacles dwarf or entirely blot out of the picture the multitudinous common people who are, according to Lincoln, so well-beloved of God. For the past five years, Ford has been making the most far-flung search for mementos of the life of the past in America, which has ever been conducted by either individual or institution.

It is Ford's purpose to reconstitute the American past, in particular the life of the common people. Buildings, inventions, implements, household utensils, musical instruments, vehicles, furniture, costumes, what you will—no phase of life will be neglected. There is a deep sentimental motive in this, as well as a fine historical purpose. At first Ford wished to restore to its original condition the environment in which his beloved mother had lived. From this beginning in the restoration of his birthplace, the passion for the restoration of America's past grew beyond all bounds. He restored the Botsford Inn, sixteen miles from Detroit; the Wayside Inn, near Sudbury, Massachusetts; and brought back into vogue the old-fashioned music and dancing.

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On a 125-acre tract of land near Detroit, he is erecting a great museum of colossal size, including an entire old-fashioned village—a pageant of America's progress and a panorama of her past. Real, not bunk, is this form of American history.

Henry Ford is the Mussolini of contemporary business. The Ford industries constitute the Fascismo of contemporary manufacture. Ford is ruthlessly humane, antiseptically clean, chemically pure, in all that he undertakes. And this characterization refers to everything, from the complex to the simple, from administration to sanitation. Ford is not a democrat in the field of business: he is an avowed aristocrat. His industrial rule is that of a despot: but a highly efficient and entirely benevolent despot. His will is law. Like Edison, he spends vast sums in endless experimentation upon a single detail; and if two thousand nine hundred and ninety-nine out of three thousand fail, he has learned just so many things *not* to do. All of his efforts are bent toward a solitary end: the creation of an article, for which there is a widely felt need, which shall meet the most rigorous tests of criti-

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cism and trial, of theory and practice; and which can be sold at moderate price to the consumer and reasonable profit to the manufacturer. No better values for the money than Ford products were ever manufactured. Their manufacture, and that is the miracle, has created one of the colossal fortunes of history.

Ford is a deep thinker. He is able to recognize, as he puts it, that "merely having something on your mind is not thinking." His thinking has resulted in the introduction of two epochal transformations in industry and the art of life-working: mass production and the five-day week. Thinkers everywhere today, men and women who are philosophically and socially minded, recognize the inherent dangers to the human factor in mass production. The evils of repetitive labor have a powerful tendency to the Robotization of labor. The process has already reached the danger mark: the time has come for taking careful inventory of the situation from the personal and human standpoint. Voices of alarm are heard on all sides, deploring the machinal and dehumanizing evils of repetitive labor, the dulling of human sensibilities through the

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endless doing of the same minor job. Ford reacts strongly against the notion that labor has become the slave of the machine. "It is a mistake," he vehemently affirms, "to think that we are living in a *machine age*. That's one of those bugaboos which people who do not understand the changing fundamentals of our civilization have set up. They prophesy all sorts of things because we have been freeing men for centuries and making it possible for them to widen their lives. We are *not* living in a machine age, *we are living in the power age*. This power age of ours has great possibilities, depending upon how we use it. Of course it can be abused. But it can also be used greatly to benefit mankind."

Socialists of the type of Bernard Shaw, shocked at the domination of men by machines, are urging what they call the Leisure State upon the consideration of mankind. When Ford announced the permanent adoption of the five-day week in his plants, a year or more ago, he was indubitably taking this radical step, in order to nullify in part the deadening and dehumanizing effects of repetitive labor. Ford maintains that in mass production "the physical load is lifted

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off men and placed on machines," and that "recurrent mental load is shifted from men in production to men in designing." As to the contention that machines become the masters of men, in mass production, he retorts that "the machines have increased men's mastery of their environment, and that a generation which is ceaselessly scrapping its machines exhibits few indications of mechanical subjection." The purpose of the five-day week is to safeguard human values in the face of the general mechanizing process. By speeding up the industrial rate of production and tightening up the efficiency, no loss either to the manufacturer in output or to the laborer in wages is sustained. It is Ford's solution of the problem of how to enable the country to absorb its production and remain prosperous.

In truth, Henry Ford irresistibly reminds us of the Americans we feel to be truly typical of our civilization and products of the genius of our race: Benjamin Franklin and Abraham Lincoln. Ford resembles them because—I use his own words—they thought in fundamentals. They dreamed in terms of universal human needs. The man with thin ascetic face and dreaming eyes,

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who launched the Peace Ship, upon a sea of jeers which rolled round all the world, was hoping and planning and working for the alleviation of incredible human suffering and for the speedy cessation of indescribable human woes. All honor to the dreamer who saw what we clearly see today, in these piping times of peace: that war is intolerable, and that the human race was made not for self-destruction, but for work, for brotherhood, and for happiness.

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### CONTEMPORARY CLASSIC

**I**N 1907, when the Nobel Prize for literature was awarded to Rudyard Kipling, many were disposed to question the award to a "disciple of brute force," of a prize for "the person who shall have produced in the field of literature the most distinguished work of an idealistic tendency." The award was specifically made to Kipling "in consideration of the power of observation, originality of imagination, and also the manly strength in the art of perception and delineation that characterize the writings of this world-renowned author."

For all his fierce nationalism and predominantly imperialistic spirit, Kipling indubitably voices a virile challenge to youth that may well be classed as "robust idealism." In theology, Kipling is thoroughly elemental, Mohammedan rather than Christian. His deity is an Old Testament God of wrath and vengeance, not a New Testament God of pity and love. His God is a

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super-realist, efficient, masterful, austere, a great artist. In Kipling's view, heaven is a happy study, an *atelier* of ambitious pupils, presided over by the "Master of All Good Workmen."

And only the Master shall praise us, and only the Master shall blame;  
And no one shall work for money, and no one shall work for fame;  
But each for the joy of the working, and each, in his separate star,  
Shall draw the Thing as he sees It for the God of Things as They Are!

While granting the romantic materialism, the thrill of adventurous striving in many of his stories and poems, I maintain that Kipling both thinks himself, and is, a realist. If his national gospel is one of "reeking tube and iron shard," at least he retains the sanity in peace times which presses for preparedness. With all of his love for England and the English, no one can be more denunciatory of the soft slackers of peace:

. . . the flannelled fools at the wicket  
Or the muddied oafs at the goals.

The militant challenge, the virile idealism of Kipling has been one of the tremendous in-

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fluences of our day. The gospel of manliness, the apotheosis of duty, obedience, discipline, the admiration well-nigh amounting to deification of efficiency, give him an almost American quality. These characteristics are stamped in bold superscription upon his entire work. These are the traits which challenge the spirit and fire the loyalty of youth, with a passion to "play the game," to "do the job," whatever it be, with the skill of a surveyor or the efficiency of an engineer. The poem "If," with its catalogue of superhuman moral achievements, is a stirring challenge which, hanging framed upon countless walls, has moved youth in all lands to its very depths:

If you can talk with crowds and keep your virtue,  
Or walk with Kings—nor lose the common touch,  
If neither foes nor loving friends can hurt you,  
If all men count with you, but none too much;  
If you can fill the unforgiving minute  
With sixty seconds' worth of distance run,  
Yours is the Earth and everything that's in it,  
And—which is more—you'll be a Man, my son!

If Kipling seems at times a sort of magnified and glorified Edgar Guest, if the mechanical

rhythms of his verse often hammer monotonously in our brain, if the *clichés* of his thought seem too often of a signal banality, at least they have that sort of universal quality which sets tripping the quoting tongues of multitudes. Twenty years ago Kipling was the most frequently quoted author in Anglo-Saxon countries. His verse was known alike to "intelligentsia" and "booboisie," to college professor and commercial traveler. "Mandalay," "Danny Deever," "Fuzzy-Wuzzy," "The Recessional," "If," "Gunga Din," "Soldier an' Sailor Too" and how many another lilting poem became part of everyone's intellectual baggage. When a ship at sea went down, some years ago, far away from succor, the last words that reached a waiting world, clicked out after the *S O S* signal of wireless, were:

What dam of lances brought thee forth  
To jest at dawn with death?

Phrases from his poems became, through constant quotation, a part of current speech: "The Colonel's lady and Judy O'Grady"; "The female of the species is more deadly than the male";

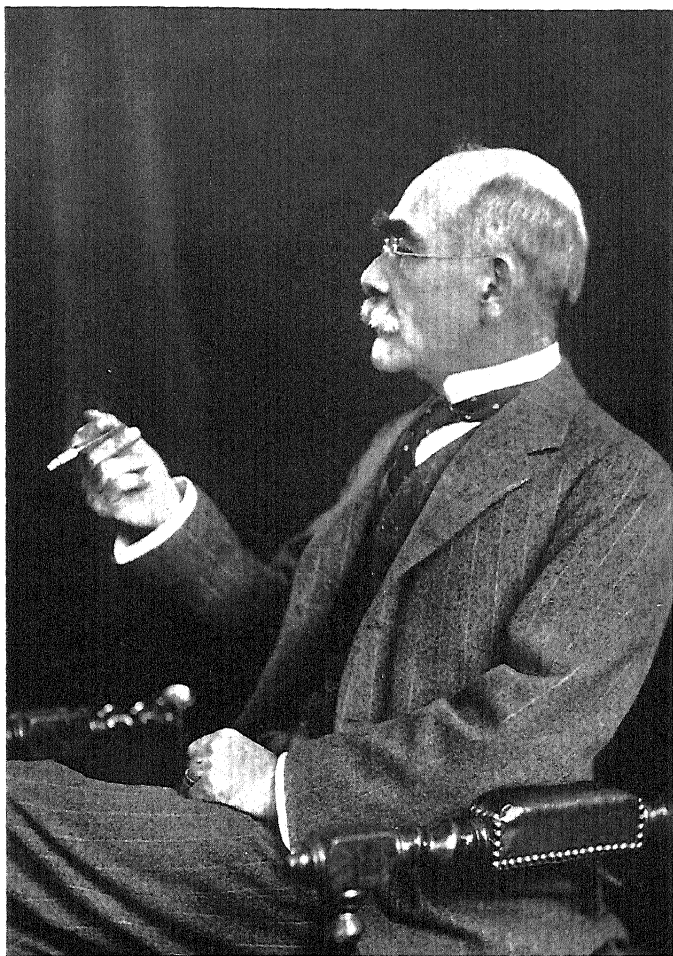
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“And what should they know of England who only England know?”; “The white man’s burden”; and the ribald stanza descriptive of an American:

Enslaved, illogical, elate,  
He greets th’ embarrassed Gods, nor fears  
To shake the iron hand of Fate  
Or match with Destiny for beers.

Guedalla finds Kipling so antiquated today that, as he puts it, a “Dinosaur” might give him “points in modernity.” But I sometimes think that the unparalleled influence which Kipling exerted upon contemporary verse has bred in us a certain weariness born of too great familiarity. Quotations from O. Henry and Kipling have become like those from Shakespeare and the Bible, a part of our currency of speech.

In a large social and political sense, Kipling is less a poet than a prophet in verse. At every great crisis in British affairs, local, national, and international, the voice of Kipling was heard in the land, in warning, in denunciation, or in defiance. Who can forget the days when Britain was stirred to alarm over the Russian menace



*Courtesy Doubleday, Doran and Company*

*Rudyard Kipling*

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to her Eastern possessions through the Khyber Pass; or Kipling's impassioned challenge:

When he stands up like a tired man, tottering near and  
near;  
When he stands up as pleading, in wavering, man-  
brute guise. . . .  
When he shows as seeking quarter, with paws like  
hands in prayer,  
That is the time of peril—the time of the Truce of  
the Bear!  
*Make ye no truce with Adam-zad—the bear that walks  
like a man!*

Kipling's implacable spirit is revealed in the publishers' note to the poem, "The Rowers," in his book of war-verse, *The Years Between*: "Originally published in the London *Times* in 1902 at the time when Germany wished to embroil England with the United States," it is "noteworthy for the first use of the word 'Hun.'" When Germany then proposed that England should help her in a naval demonstration to collect debts from Venezuela, Kipling wrote the following violent protest against "striking hands with these," the "worst of all":

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In sight of peace—from the Narrow Seas  
O'er half the world to run—  
With a cheated crew, to league anew  
With the Goth and the shameless Hun!

Kipling's position as a political verse-writer, a composer of occasional poems of national and international significance, is akin to that once occupied by Hugo in France, by D'Annunzio in Italy of recent years. There was a time, some two and more decades ago, when Kipling was the embodied symbol of English imperialism.

Born in Bombay, on December 30, 1865, Rudyard Kipling found in "Mother India" an *alma mater* for nourishing and developing his brilliant talents. All the strange, recondite influences of the East, which surrounded him in his childhood and influenced him even in the arms of his *ayah*, were later to find literary expression in the greatest short stories of the age. After travels with his father, studies at the United Service College, where he was the editor of the *U. S. C. Chronicle* during his last two years in school, he returned to India in his seventeenth year and took his first job as a journalist on the *Civil and Military Gazette*, at Lahore. Here he learned, as he con-

fesses, the lesson of loyalty to his newspaper, which he issued in hot weather and in cold, in sickness and in health. He wrote little verses and ditties for the paper; and Ruku-Din, the native foreman, would say to him: "Your poetry very good, sir; just coming length today. You giving more soon? One-third column just proper. Always can take on third page." The friendly Ruku-Din was evidently an expert journalist, if no judge of poetry—which he esteemed merely for its space-filling qualities! Then *Departmental Ditties* were finally issued by Kipling in an original form—a "lean, oblong docket, wire stitched, to imitate a D. O. government envelope, printed on one side only, bound in brown paper and tied with red tape." Although there were other editions later, Kipling said of this book that he "loved it best when it was a little brown baby with a pink string round its stomach, a child's child, ignorant that it was afflicted with all the most modern ailments; and before people had learned, beyond doubt, how its author lay awake of nights in India, plotting and scheming to write something that should 'take' with the English public."

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Kipling began his career as a journalist and journalist he has remained. The mark of the journalist is writ large upon the greater proportion of his writings. In 1890, after having been working for some time on the Allahabad *Pioneer*, he set sail for England, stopping in the United States on the way. He was now in the country of his literary master, Bret Harte; and he is on record in praise of two other famous American writers who influenced him, Poe and Mark Twain. But the time was not ripe for his acceptance by America; and it was not until he reached London that he was able to find a publisher for *Departmental Ditties*. Although literary London recognized his talent, and Edmund Gosse paid him flattering tributes, his book was slow in "catching on." But when recognition finally came, it came with a rush. Kipling was "discovered" with delight by the man-in-the-street, who found in his writing "a refuge from the drudgery of the day." It was the beginning of a colossal success.

As a college boy, I enjoyed no book more than *The Naulahka*, written by Kipling in collabora-

tion with his brother-in-law, Wolcott Balestier. In 1892, in "the first flush of his golden success," Kipling was married to Carolyn Balestier, and came to America to live. He bought, at Brattleboro, Vermont, a home, which he named "Naulahka." Sir Arthur Conan Doyle says this step was prompted by "chivalrous devotion" to his wife, which caused him to settle in America lest she miss her home and friends. From this time forward Kipling takes his stride. Except for travel, his life, externally, has been singularly uneventful. I recall vividly the extraordinary concern universally manifested in this country in 1899 when Mr. Kipling was desperately ill of pneumonia. No greater concern could have been displayed over the illness of any public man. "There was probably," says Anice Page Cooper, "no living author regarded with such spontaneous veneration by a public scattered so widely over the face of the world. . . . For weeks Kipling lay at the point of death in a New York hotel while the journals of both England and America voiced an unwonted closeness of fellowship drawn together by this sympathy for the suffering of one whose stories and songs had be-

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come a part of the literary heritage of all English-speaking people."

After his recovery, Kipling returned to England and purchased a home at Bateman's, near the village of Burwash in Sussex. There for the past twenty-eight years he has lived with his family, in a rather marked seclusion. In this interval, strangely enough, his fame has not appreciably grown—although this period has been marked by some notable work. For the past two decades, Kipling has gradually receded from public view; but from time to time, he has spoken with eloquent voice and aroused storms of discussion. Only the other day, he was the center of a vehement controversy when a British choir refused to sing his "Hymn Before Action" on the grounds of its pagan character. "In the mouths of troops of savages bent on slaughter and calling on their tribal deity, such words might be appropriate enough," wrote the choir secretary. "But they present a primitive, unworthy conception of the Deity and are unfit to be sung by a choir in an English church."

Although Kipling's fame has lessened appreciably in recent years, so far as public acclaim

is concerned, his tremendous hold on the public is evidenced in the annual sales of his books, which run into hundreds of thousands. His writings have been translated, in part, into Danish, Dutch, French, German, Italian, Norwegian, Polish, Russian, Serbian, Spanish, and Swedish. He was elected Rector of St. Andrew's University in 1923; and in his rectorial address, "Independence," he attracted international attention by urging the fundamental duty of developing one's individuality. Today first editions of Kipling's writings, which have appeared in many forms, bring staggering prices—such as seventeen thousand dollars for "Wee Willie Winkie" and other stories, illustrated by the author."

Kipling's India is a realm, a world, which will be studied to the end of time. *The Jungle Books* constitute an immortal work; and, according to Leonard Bacon, "Mowgli satisfies part of the soul, as Don Quixote and Hamlet and Gargantua and Robinson Crusoe and Tom Jones satisfy." Few will dispute the position he long held as the greatest living short-story writer. "Without Benefit of Clergy," "The Bridge Builders," "They," "Brushwood Boy," "With the Night

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Mail," "Wireless," "The Ship that Found Herself," "Mrs. Bathurst"—these stand high above the mass and dead level of contemporary literature. Kipling "created" the present Tommy Atkins, a type immortalized in his astounding soldiers three: Mulvaney, Ortheris, and Learoyd.

It is said on high authority that, through the influence of Kipling's writings concerning the British army service, Tommy Atkins, the British private, has been transformed from a "bluff, rather surly person," into a "cheery, devil-may-care, lovable" fellow. Surely not a great poet, Kipling; but an extraordinarily effective one, burning with poetic intensity and passion, vigorous, trenchant, gripping. A journalist of the first rank, whatever he writes: there is no better living.

Few poets have possessed such universal appeal for all ages, classes, conditions, and nationalities. He was beloved by the man-in-the-street, appreciated by the scholar in his study; and although he is primarily a man's poet, he was scarcely less enjoyed by women than by men. Aside from the swing and rhythm of his verses, their power and passion carry its own conviction.

It has become the fashion of the so-called "modernists" to scoff at Kipling as outmoded along with other great writers of an earlier generation; but the secret of his power is too deeply a part of universal human feeling to be lost in a ripple on the sea of time. The swinging, martial quality of his verse quickens the pulses like a battle cry; but if he is a singer of brute force, it is a clean and elemental force which finds its echo in the heart of every creature capable of a noble *saeva indignatio*.

Kipling's songs and ballads first caught the ear of the multitude, but his prose writings have captured and held the heart of the world. The glow and color of his imagination illumines all his work, and the variety and richness of his fancy ranges over a widely diversified field of human experience and feeling. It is a far reach from the rough and ready anecdotes of the barracks to the delicate fantasy of "They"; from the magic wonderland of the Jungle to the simple and poignant pathos of "Baa, Baa, Black Sheep," but no arid stretches lie between. There are battle, murder, and sudden death, but the heroes of these tales of violence are human be-

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ings, even as we are, comic, tragic, and tender. Adventure, mystery, romance, the gaiety and the tragedy of childhood and of maturity are all set forth, and are alike illumined with the understanding and the simple veracity of art. Because he deals directly with the fundamental human verities, his work assumes the form of the verities themselves. Kipling sees into the heart of mankind, and having seen, he portrays for a world less penetrating of vision, the image of life itself.

Kipling's chief claim to greatness is as an eloquent and impassioned spokesman of the Anglo-Saxon race. In him is incarnated—by general acknowledgment—an innate, mystic consciousness of the lofty destiny of English-speaking peoples. One need not be an Englishman to glow responsively to "The English Flag":

The dead dumb fog hath wrapped it—the frozen dew  
have kissed—  
The naked stars have seen it, a fellow-star in the mist.  
What is the Flag of England? Ye have but my breath  
to dare,  
Ye have but my waves to conquer. Go forth, for it is  
there.

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For all his raucous jingoism, his impassioned imperialism, his superb consciousness of the manifest destiny of the Briton to rule others, Kipling nevertheless imperishably stands for the ancient culture, the ingrained faith, the ideal which is England. Search the Mandalay Edition from end to end, and you will find writ large everywhere a sense of supreme devotion to country: Duty, Service, Obedience, Discipline, Loyalty. Rupert Brooke's soldier voices, in lyric note, the essential meaning and the true greatness of Kipling:

If I should die, think only this of me:  
That there's some corner of a foreign field  
That is for ever England. There shall be  
In that rich earth a richer dust concealed;  
A dust whom England bore, shaped, made aware,  
Gave, once, her flowers to love, her ways to roam,  
A body of England's, breathing English air,  
Washed by the rivers, blest by suns of home.









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